

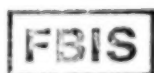
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7 January 1985

USSR Report

LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES



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7 January 1985

USSR REPORT
LIFE SCIENCES
BIOMEDICAL AND BEHAVIORAL SCIENCES

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BIOCHEMISTRY

PROGRESS IN BIOLOGY, MEDICINE

Moscow LENINSKOYE ZNAMYA in Russian 27 Sep 84 p 3

LIKHTENSHTEYN, G., Laboratory Chief, Division of Institute of Chemical Physics, USSR Academy of Sciences, doctor of chemical sciences, professor, Laureate of the USSR State Prize, Chernogolovka

[Abstract] Each era of human development has its own peculiar "brand." The most recent developments in the science are in the area of molecular biology. Biological systems are highly organized, with complex chemical and physical processes. Many important biological processes involve compounds containing unshared electrons: free radicals and ions. Back in the 50's, Professor L. A. Blyumenfel'd proposed a new method for studying the processes involving such unshared electrons: electronic paramagnetic resonance (EPR) based on absorption of ultrahigh frequency electromagnetic field by compounds containing unshared electrons. The scientific staff at the Institute of Chemical Physics, USSR Academy of Sciences contributed largely to achievements in this field in their attempt to win the USSR State Prize: adaptation of EPR to biological systems, work at super low temperatures, involvement of computers, studies of the effect of UV irradiation, changes in the paramagnetism of the endocrine glands, work in a new type of paramagnetic resonance on complexes of iron with nitrogen oxides, etc.

[048-7813]

UDC 577.154

IMMOBILIZATION OF RAT LIVER MICROSOMAL FRACTION

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 278, No 1, Sep 84
(manuscript received 5 Dec 83) pp 233-236

DAVIDENKO, T. I., SEVAST'YANOV, O. V., POMOGAYLO, A. D. and BOGATSKIY, A. V. (deceased), academician, Ukrainian SSSR Academy of Sciences, Physicochemical Institute, Ukrainian SSR Academy of Sciences, Odessa

[Abstract] Polyacrylamide gel (PAAG) and polyethylene grafts (PEG) were tested for their suitability in immobilizing the microsomal fraction

prepared from rat hepatocytes. PAAG was found unsuitable for the preparation of immobilized microsomal fractions due to excessive loss of mono-oxygenase activity. Superior results were obtained with PEG with polyacrylic acid with graft:polyethylene ratio of 1:8 to 1:12, with immobilization conducted at 5°C for 24/h. On storage the preparations were stable for 4 weeks at 5°C and retained ca. 110% of original activity at pH 7.6. Optimum mono-oxygenase activity was obtained at 50°C with aniline substrate and at 37°C with dimethylaniline substrate. High levels of mono-oxygenase activities were also retained by preparations involving PEG with polyallyl alcohol, yielding immobilized preparations that were stable for 6 months at 4-5°C, and retained 20% of original enzyme activity at the end of the storage period. References 6: 3 Russian, 3 Western.
[037-12172]

UDC 577.15.08+577.112.4+541.132.6

ENZYME MODIFICATION BY WATER-INSOLUBLE REAGENTS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 278, No 1, Sep 84
(manuscript received 3 Feb 84) pp 246-248

LEVASHOV, A. V., KABANOV, A. V., KHMEL'NITSKIY, Yu. L., BEREZIN, I. V., corresponding member, USSR Academy of Sciences, and MARTINEK, K., Moscow State University imeni M. V. Lomonosov

[Abstract] Alpha-chymotrypsin was employed as a test protein to determine optimum conditions under which enzymes and, by extension, other proteins could be rendered hydrophobic, to some extent, by modification with water-insoluble reagents. Successful acylation of chymotrypsin was obtained by employing the wetting agent docusate sodium (Aerosol OT, Merck), which facilitated acylation at mycellar surface. To 10 ml of 0.01 M docusate sodium in octane was added 0.45 ml of chymotrypsin (3-5 mM in 0.02 M phosphate buffer, pH 8.5), followed by the addition of ca. 100 μ L of stearoyl chloride (0.1 M in docusate sodium/octate). The mixture was mixed and stored overnight at room temperature. The protein was recovered by the addition of 10-fold volume of cold acetone, yielding a recovery of 95-97%. Sedimentation patterns revealed no protein aggregation, and gel filtration on Sephadex G-50 indicated 80% yield of acylated enzyme with 1-2 stearoyl groups per molecule. Such preparations retained 60% of original enzymatic activity, and suggested that other proteins can be so modified under similar conditions. Figures 1; references 11: 3 Russian, 8 Western.
[037-12172]

BIOPHYSICS

BOOK: GENERATION, DISPERSION OF AUTOWAVES

Moscow AVTOVOLNY (NOVOYE V ZHIZNI, NAUKE, TEKHNIKE: SERIYA "FIZIKA") No 10, 1984 in Russian (signed to press 5 Sep 84) p 2

[Annotation and table of contents from book by V. I. Krinskiy, doctor of physical-mathematical sciences and Lenin prize laureate, and A. S. Mikhaylov, candidate in physical-mathematical sciences: "Autowaves", Moscow, Znaniye, 1984, 64 pages, 33,500 copies]

[Text] Annotation

The brochure examines questions associated with the dispersion of autowaves-- generation waves in active media with dissipation and boosting of energy. The properties of autowaves are discussed, as well as the processes of interaction between them and the action mechanisms of autowave sources. Autowave processes in biologically active media--in cardiac tissue and in the cerebral cortex--are explained. Results of experiments on the study of autowaves with the Belousov-Zhabotinskiy reaction are presented. The prospects for application of autowave effects in electronic technology are examined.

The brochure is intended for a wide range of readers interested in the achievements of modern physics and biophysics.

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CSO: 1840/053

ENVIRONMENT

UDC 614.7:622.332(571.51)

ENVIRONMENTAL HEALTH IN INDUSTRIAL DEVELOPMENT IN KANSKACHINSK FUEL, ENERGY COMPLEX AREA

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 30 Jul 82) pp 7-9

SHITSKOVA, A. P., BORISENKOVA, R. V., GIL'DENSKIOL'D, R. S., PLITMAN, S. I., KRASNOPEVTSEV, V. M., STEPANOV, L. G., TITKOVA, N. N., ABRAMOVA, E. M. and BLOKHINA, L. M., Moscow Scientific Research Institute of Hygiene imeni F. F. Erisman; Krasnoyarsk Kray Sanitary Epidemiologic Station

[Abstract] An environmental and hygienic assessment was conducted in the Kansk-Achinsk industrial region, which promises to be one of the leading sources of fuel energy for Siberia. All-encompassing studies on environmental health and ecological impact of the industrial development have shown the absence of any major adverse effects, and a generally satisfactory state of affairs. For example, within the site of the Nazarov power station, sulfur dioxide, nitrogen oxide and dust levels do not pose a threat to man or nature; however, some thermal effects have been noted on the aquatic flora. Relatively good indicators of occupational health prevail in the various mining operations. Cardiovascular diseases were the leading cause of morbidity (18.2%), followed in importance by disorders of the peripheral nervous system (13.9%), gastrointestinal pathology (10.9%) and respiratory diseases (10.3%). Analysis of food supplies and dietary practices in the vicinity of the Nazarov power plant indicated that the nutritional status in the area is satisfactory. [1551-12172]

HYGIENIC MONITORING OF DOMESTIC WATER SUPPLIES FROM IRRIGATING SYSTEMS IN UZBEKISTAN

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 29 Feb 84) pp 68-69

IL'INSKIY, I. I., ISKANDAROV, T. I., BAKHRETDINOV, Sh. S. and USMANOV, I. A. Scientific Research Institute of Sanitation, Hygiene and Occupational Diseases, Uzbek SSR Ministry of Health, Tashkent

[Abstract] A discussion is presented in general terms of the problems of safe domestic water in Uzbekistan, most of which is derived from irrigating systems. In general, high quality water is obtained in accordance with GOST standards. However, continuous monitoring is required because of equipment failure at water-treatment plants, particularly during the hot seasons, and the possibility of reservoir pollution under the climatic conditions prevalent in Uzbekistan. In addition, special attention must be accorded to chlorination procedures and the monitoring of chlorine levels, especially since overchlorinated water has been shown to have carcinogenic potential.

[1551-12172]

UDC 613.281:6;3.22

BIOLOGICAL EVALUATION OF NEW MEAT PRODUCTS FOR PEDIATRIC AND DIETETIC NUTRITION

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 16 Dec 83) pp 12-14

KHOVAYEVA, L. A., TEREKHIN, S. P. and AFANAS'YEVA, N. A., First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] A biological evaluation was conducted of new canned meat products intended for children and as dietary supplements. Using albino rats, the products were evaluated in reference to the various technical steps involved in the preparation (thermal treatment, substitution of vegetable oils for animal fats, dairy and vegetable additives, etc.). Analysis of the various factors led to identification of acceptable and unacceptable additives and substituents that may be used in the canned chicken and beef products. For example, it has been demonstrated that one of the common additives in pediatric products, starch, diminished the nutritive value for rat weanlings, resulting in decreased weight and accumulation of liver lipids. In addition, during heating, the various starch products may react with proteins leading to the formation of polycondensation products and eliminating 20-50% of the free amino acids in the food. The polycondensation products themselves may exert toxic effects on the liver and generative organs. These observations point to the need for constant monitoring of food products, particularly those designed for children, to ensure the manufacture of the highest quality nutrient. References 9 (Russian). [1551-12172]

SAFETY EVALUATION OF OZONE TREATMENT FOR PROLONGING STORAGE OF AGRICULTURAL PRODUCTS

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 24 Jan 84) pp 15-17

BUSLOVICH, S. Yu., BAGEL', I. M., BOGDAN, A. S., DUBENETSKAYA, M. M., YENSHINA, A. N., KOLDOBSKAYA, F. D. (deceased) and CHUYKO, M. P., Belorussian Scientific Research Sanitary Hygiene Institute, Minsk

[Abstract] Ozone was evaluated as a preservative for potatoes under several conditions of preservation or storage, to evaluate the rate and dose of application. Chemical analysis of the treated potatoes and toxicity studies on weanling rats showed that ozone per se had no adverse effects on the potatoes in the optimum dose range of 20-40 mg/m³, with 4 h exposures for 25 treatments. Similarly, when tested on the rats within 18 h of treatment no organoleptic effects were evident. The latter was also confirmed by a lack of any biological consequences on Tetrahymena. While ozone appears to be entirely safe when used to prolong storage life of potatoes, other agricultural products will have to be analyzed on an individual basis to determine the spectrum of application of ozone in the preservation of agricultural products. References 7 (Russian). [1551-12172]

UDC 612.766.1-087:519.24(049.2)

POSSIBILITY OF INTEGRATED FATIGUE ASSESSMENT

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 16 Dec 83) pp 58-59

ROSENBLAT, V. V., Ural Institute of Forest Technology imeni Komsomol, Sverdlovsk

[Abstract] The article by Kutsenko et al. [Kutsenko, GI, et al., Gig. i. San., No 8:53-55, 1982] on integrative evaluation of fatigue has stirred considerable controversy, since it represents an attempt at quantification of both subjective and objective factors. A positive aspect in their work is the use of a set of indicators to assess gradual changes in various parameters. However, the use of regression analysis and standard scale units (and their averages) seems dubious, since an overload of one functional system and its relative inefficiency is not necessarily compensated for by other systems that may be underutilized. A relatively simple equation is suggested for the contribution of various indices to an overall index having a standard scale of 100. In the latter approach, minor indicators of fatigue are related to major indicators, and their relative contribution can be estimated. References 8: 6 Russian, 2 Western.
[1551-12172]

LASER TREATMENT OF PERIPHERAL NERVOUS DISEASES

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 29 Jun 83) pp 100-104

DURINYAN, R. A., ANISHCHENKO, G. Ya., KOCHETKOV, V. D. and YEVTIFEYEVA, Ye.S., Central Scientific Research Institute of Reflexotherapy, Main Public Health Administration, Moscow City Executive Committee

[Abstract] The clinical effectiveness of helium-neon laser (10-20 mW/cm², total energy 0.5-2 J/cm² after 10-12 treatments; repeated in 15 days if needed) was tested on 487 patients, 17 to 70 years old, with the radicular syndrome, trigeminal neuralgia, or alcoholic or diabetic polyneuropathy or polyneuritis. Evaluation of the clinical results indicated that marked improvement was noted in 34 of 68 patients with trigeminal neuralgia, and in 40 of 59 subjects with alcoholic or diabetic polyneuropathy. On an overall basis, satisfactory results were obtained in a total of 148 of the patients, the disease process was unaffected in 43, and deterioration was observed in three cases. Concomitant analysis of EKGs, EEGs and EMGs showed that laser puncture did not involve any systemic effects and, consequently, that low-dose helium-neon laser irradiation can yield positive results in some cases of peripheral nerve neuropathy. References 9 (Russian). [1544-12172]

MARINE MAMMALS

MENTAL PROCESSES OF DOLPHINS, MAN

Moscow NEDELYA in Russian No 39 (1279) Sep 84 p 5

KORAROVITSKIY, LEONID

[Abstract] A review is presented of the film "Man and Dolphins," the article discusses some aspects of dolphin mental processes in comparison with those of man. Using A. N. Severtsov's hypothesis concerning the existence of a "reserve mind" in animals, Kozarovitskiy describes this process as a totally different process from that existing in man. In spite of many biological similarities in the mental functions of man and animals, a significant difference is found in man's engaging in social labor, abstract thought, consciousness, self-consciousness, etc. Nest building by birds and bird song are not analogous to similar actions performed by man. Animals have only the biological prerequisites of intellectual activity pursued by man, hence animal behavior should be studied as "animals in the animal world and man in man's world." Kozarovitskiy debunks many stories concerning human-like activities of dolphins. He praises the film for its warmth and tenderness and its message that all living things need love.
[027-2791]

MEDICINE

UDC 616.24-002.5-06:616.89-008.441.13-036.12]-085.281.873.21-06

SIDE EFFECTS OF ANTITUBERCULOSIS DRUGS IN CHRONIC ALCOHOLICS WITH PULMONARY TUBERCULOSIS

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 10 Nov 83) pp 7-10

RUDOY, N. M., Professor, and CHUBAKOV, T. Ch., Dispensary Department, Central Scientific Research Tuberculosis Institute, USSR Ministry of Health, Moscow

[Abstract] Nine antitubercular drugs were assessed for side effects in 186 patients with pulmonary tuberculosis, for comparison with a 266 patient cohort with chronic alcoholism. The study excluded allergic responses. Two-thirds of the patients with tuberculosis and alcoholism tolerated the chemotherapy poorly, as indicated by development of gastrointestinal, cardiovascular and neuropsychiatric symptomatology. The incidence of toxic side effects was 1.5-times higher in the chronic alcoholics. The reactions and incidence was particularly pronounced with cycloserine and rifampin, accounting for 66.6 and 21.9% of all the cases of toxicity, respectively. Rifampin and cycloserine can, therefore, be regarded as being contraindicated in the management of chronic alcoholics with pulmonary tuberculosis. Furthermore, since manifestations of side effects often mimic those of withdrawal symptoms, clinical observations for evidence of toxicity are best limited to periods of abstinence. References 9: 7 Russian, 1 Polish, 1 Western.
[1544-12172]

MANAGEMENT OF DELIRIUM TREMENS

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 13 Apr 83) pp 96-100

TSELIBEYEV, B. A., professor, and ROYZENVASSER, A. S., All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serskiy; Psychosomatic Department, No 1 Municipalr Clinic imeni N. I. Pirogov

[Abstract] A brief review is presented on the chemotherapeutic management of delirium tremens, with consideration of the various somatic manifestations that may accompany such a state. Considerable clinical acumen has to be exercised in treatment of such patients, particularly where there is no reliable medical history, or where a patient denies being an alcoholic. Recommended doses are given, with caution about individual conditions, and emphasis is placed on keeping a high index of suspicion for infectious diseases. References 7: 4 Russian, 3 Western
[1544-12172]

BIOLOGICAL CHARACTERISTICS OF HALOPHILIC METHANOGEN ISOLATED FROM OIL FIELD

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 278, No 1, Sep 84
(manuscript received 3 May 84) pp 227-230

OBRAZTSOVA, A. Ya., SHIPIN, O. V., BELYAYEV, S. S. and IVANOV, M. V.,
corresponding member, USSR Academy of Sciences, Institute of Biochemistry and
Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow
Oblast

[Abstract] Isolation studies on high-salt solid media led to the isolation of a novel methanogen from the No 283 Bondyuzhskiy oil field. On mineral medium No 15, with 70 g/liter salt content, round, concave colonies developed that reached a diameter of 1 mm in 15 days. The colonies were pale yellow in color, giving green fluorescence under UV light, and consisted of irregular coccoid forms (0.8-1.5 μ m). Growth and methane formation occurred at 15-50°C at pH 5.9-8.2. The optimum temperature and pH ranges for growth and methanogenesis were 28-37°C and 6.8-7.3, respectively. Growth tolerated an NaCl concentration ranging from 100-140 g/liter, but with an optimum at 60 g/liter. Observations of other characteristics and a G+C value of 43.0 mol% indicated that the new isolate belongs to the *Methanohalobium* genus, and has been designated as *M. euhalobius*. Figures 2; references 12: 5 Russian, 7 Western.
[037-12172]

NONIONIZING ELECTROMAGNETIC RADIATION

UDC 613.647

SAFETY ASSESSMENT METHODOLOGY FOR TWO-FREQUENCY ELECTROMAGNETIC FIELD COMBINATIONS

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 2 Sep 83) pp 38-42

DUMANSKIY, Yu. D., IVANOV, D. S., NIKITINA, N. G., KARACHEV, I. I., BITKIN, S. V. and SOLDATCHENKOV, V. N., Kiev Scientific Research Institute of General and Communal Hygiene imeni A. N. Marzeyev

[Abstract] Mathematical analysis was conducted on the risk posed by exposure to electromagnetic fields of different frequencies by deriving equations for estimating permissible exposures. The results demonstrated that a combination of two fields with different frequencies, including alternations of exposure, must be evaluated for each frequency. A functional relationship between the two fields must be determined using parameter 'd', where d represents the ratio of the power flux densities of the two frequencies in question. The parameter d, then, is a characteristic attribute of the total field that facilitates construction of graphic plots for the estimation of the maximum permissible intensity for each frequency. Figures 2; references 3 (Russian).
[1551-12172]

UDC 613.644/.647]-07:612.017.1.014.44/.45

IMMUNOLOGICAL CRITERIA IN RISK ASSESSMENT OF NONIONIZING RADIATION

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 25 Oct 83) pp 52-56

BATANOV, G. V. and TRIFONOV, S. I.

[Abstract] A survey is presented of the use of immunological criteria in determining safety limits for nonionizing radiation, in view of occupational, medical and background exposure to various sources of electromagnetic radiation. Many components of the immune system have been shown to be very labile

to various external factors and, although experimental and clinical data are quite limited, nonionizing radiation has been demonstrated to affect certain components. For example, irradiation with low power flux density microwaves (to 1 mW/cm²) has been shown to enhance certain specific and nonspecific immune responses, while microwaves in the 1-10 mW/cm² range have been shown to be immunosuppressive. In addition, therapeutic-intensity argon, cadmium, helium-neon and chemical HF lasers have been shown to alter serum immunoglobulin levels and antibody reactivity. Other factors of the immune system found susceptible to nonionizing radiation include phagocytic activity, immune cell function, complement activity, antibody formation, etc. In all, these observations indicate that the immune system is a serious contender for the status of an indicator in assessing the physiological effects of nonionizing radiation. References 30: 25 Russian, 5 Western.
[1551-12172]

UDC 616.15-057-02:613.632.4:615.285.7

RED CELL EFFECTS FOLLOWING LONG-TERM OCCUPATIONAL EXPOSURE TO PESTICIDES

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 21 Nov 83) pp 105-108

ROMASH, A. V., candidate of biological sciences, LADNOVA, G. G., doctor of medical sciences, and DOROFYEV, V. M., Laboratory of Toxic Chemicals, All-Union Scientific Research Institute for Agricultural Occupational Safety, USSR Ministry of Agriculture, Orel

[Abstract] Various red blood cell values were determined in a group of 575 male and female agricultural workers exposed to pesticides for long periods of time, for comparison with similar parameters obtained for control donors. In comparison with the control values, the exposed individuals were characterized by hematologic changes that included depressed hemoglobin levels, reduced erythrocyte counts, diminished hematocrits, increased color index, enhanced ESR, increased levels of reticulocytes, etc. These changes were related in their degree to the duration of exposure, and compatible with a progressive course of chronic anemia. The changes, reflective of the underlying pesticide-induced pathology, were more pronounced in women than in the male workers. These observations suggest that regular monitoring of the hematologic status may provide an early indication of pesticide toxicity in the group at risk. References 23: 21 Russian, 2 Western.
[1544-12172]

CREATORS OF NEW SUBSTANCES

Moscow IZVESTIYA in Russian 19 Sep 84 p 3

EMANUEL', N., academician, Lenin Prize Laureate, State Prize Laureate

[Abstract] Experimental production of analogs which greatly exceed the therapeutic effects of penicillin was described. Isolation of 6-aminopenicillanic acid, the nucleus of penicillin, provided a base for synthesis of large numbers of new antibiotics if large-scale production of this compound can be achieved. A method of selective conversion of 6-aminopenicillanic acid was

discussed. The method involves reactions which go at room temperature in an aqueous solution. This achievement required collaboration of geneticists, microbiologists, biochemists, physicists, chemists, mathematicians and engineers, including scientists from the All-Union Scientific Research Institute of Antibiotics, Moscow State University imeni M. V. Lomonosov, Tallinn Polytechnic Institute, Riga and Saransk medical preparations plants and "Mosmedpreparaty" Production Association. Automation of production of this compound improves work conditions and reduces labor-intensiveness 5-fold with savings of raw material 5-fold in comparison with other methods of production. This production layout is superior to similar procedures developed later abroad. Development of a second industrial process, development of a "nucleus" of cephalosporins, also cannot be duplicated abroad. The economic impact of development of these processes is discussed.

[025-2791]

UDC 612.014.4

INFLUENCE OF GEOMAGNETIC DISTURBANCES ON CARDIOVASCULAR FUNCTION OF ATHLETES

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 13 May 83) pp 640-646

RYZHIKOV, G. V. and DZHEBRAILOVA, T. D., Institute of Normal Physiology imeni P. K. Anokhin, USSR Academy of Medical Sciences, Moscow

[Abstract] Eleven men 20 to 30 years of age from a rifle firing team took part in the study. EKG and arterial pressure studies were performed before and after training and competition. The variation coefficient of R-R interval, index of intensity and autonomic index were recorded. The results produced were compared with studies of the degree of disturbance, presence of magnetic storms and their force and values of K intensity index for the time period. Studies were performed daily over 3 training periods between February of 1981 and May of 1981. On days of magnetic disturbance there was a decrease in sports results. In terms of the degree of this decrease, the athletes can be divided into those resistant to magnetic disturbances, relatively resistant and nonresistant. The increase in sympathetic influences on cardiac activity during geomagnetic disturbances was observed in those cases when the autonomic index was initially close to zero, particularly when magnetic storms began suddenly. Athletes with strong sympathetic influence on cardiac activity were more resistant to the effects of geomagnetic storms. References 15: 13 Russian, 2 Western.
[804-6508]

UDC 612.825+612.843.7

FUNCTIONAL INTER-HEMISPHERE ASYMMETRY IN RECOGNITION OF VISUAL STIMULI OF VARIOUS CLASSES

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 25 May 83) pp 578-588

UDALOVA, G. P., KASHINA, I. A., Leningrad State University imeni A. A. Zhdanov

[Abstract] A study was performed to determine the variation in degree of hemisphere dominance as a function of the class of visual stimuli and time

parameters of their presentation, nature of the visual task, specifics of motor reaction, as well as sex of test subjects. The stimuli used can be considered verbalizable to some extent and can be identified primarily by means of concrete or abstract characteristics. The work utilized a set of achromatic slides with 5 classes of stimuli: abstract words, images of 6 pitchers with asymmetrical shapes, images of 6 bugs, faces of 12 young men without emotional expression, and faces of 2 young women with various highly emotional expressions. Studies were performed on 50 healthy test subjects of both sexes. Processing of the experimental material indicated the presence upon visual recognition of a certain variation of the direction and degree of manifestation of functional inter-hemisphere asymmetry as a function of the level of verbal processing of the images presented, the degree of utilization of abstract and concrete characteristics of the stimulus, its emotional coloration, time parameters of stimulation, specifics of implementation of motor reaction and sex of the test subjects. These factors should be considered when visual stimuli are used in clinical practice as tests for topic diagnosis of brain image. Figures 3; references 24; 5 Russian, 19 Western.
[804-6508]

UDC 612-08:62

ENCEPHALOGRAPHIC CORRELATES OF AUTOGENOUS CHANGE IN HUMAN FUNCTIONAL STATE

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 7 Apr 83) pp 594-596

ANTONOV, A. A., Moscow

[Abstract] A study was made of the influence of respiratory exercises used to optimize physical condition before sports contests on the functioning of the central nervous system. Twelve healthy men 28 to 35 years of age were studied in a light-and-sound-insulated chamber in the morning hours. Each subject was studied 4 times at intervals of 6 to 12 days. The MMPI test was used to evaluate the emotional-mental state before each session. EEG were recorded bipolarly in two leads from the left hemisphere with a time constant of 0.1 over 400 seconds in each stage of the study. The breathing exercises caused a change in the level of spatial synchronization of bioelectric activity of the frontal-temporal and temporal-occipital segments of the cerebral cortex. Depending on the initial emotional-mental state of the subjects, breathing exercises caused an increase in reduced or a decrease in elevated levels of spatial synchronization of bioelectric activity in these areas of the cortex. References 7: 6 Russian, 1 Western.
[804-6508]

DYNAMICS OF EXTERNAL RESPIRATION AND GAS METABOLISM UNDER COMBINED EFFECT OF HYPOXIA AND HYPERCAPNIA

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 15 Nov 82) pp 610-616

AGADZHANYAN, N. A., BRAGIN, L. Kh., DAVYDOV, G. A. and SPASSKIY, Yu. A.,
Moscow

[Abstract] Two series of experiments were performed involving 20 practically healthy men 20 to 30 years of age. One series of studies was performed in the plains, another in the mountains of central Tyan'-Shan at an altitude of 3200 m. In studies of series IA after breathing air the subjects were shifted each 15 minutes to breathing of normoxic gas mixtures with partial carbon dioxide pressure 19, 38 and 57 mmHg. In series IB-D the partial pressure of oxygen was decreased in stages to 130, 100 and 70 mmHg. In series IIA, B, the pO_2 corresponded to the oxygen content in the surrounding mountain air, 105-110 mmHg, while pCO_2 was increased to 19 and 38 mmHg, since 57 mmHg caused dyspnea. All studies were performed at rest in a seated position, except IIB, in which the test subjects performed light work, 60 kgm/min, on a bicycle ergometer. The experiments showed that a change in the number of physiological indices upon development of hypercapnia during various stages of mountain adaptation at rest are retained under moderate physical loading. Three weeks' adaptation to high mountain conditions is accompanied by a number of functional changes leading to improvement of the tolerance for high concentrations of carbon dioxide, up to 38 mmHg.

References 17: 11 Russian, 6 Western.

[804-6508]

FACTORS DETERMINING EFFECTIVENESS OF VOLUNTARY DECREASE IN VENTILATION DURING MUSCULAR WORK USING INSTRUMENTED FEEDBACK

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 7 Apr 83) pp 623-630

KUCHKIN, S. N., Institute of Physical Culture, Volgograd

[Abstract] Studies were performed on 8 practically healthy subjects 17 to 18 years of age with respiratory function and aerobic productivity corresponding to the normal for their age. The subjects performed three levels of loads on a bicycle ergometer. The first level was simple rotation of the pedals, the other two were selected to produce rates of 100-120 per minute and 150-170 per minute. The respiration pattern was recorded with a complex spirographic installation with automatic gas mixture feed. Voluntary reduced

levels of ventilation are possible within a range of 60 to 80% of the background level and limited by the imperative respiratory stimulus caused by progressive hypercapnia. The factors determining the effectiveness of voluntary reductions in ventilation are defined. Subjects with hypo- and isocapnic type of hyperpnea and normo- and tachypnoic type of basal respiration pattern most effectively control ventilation. One important criterion for increasing the effectiveness of voluntary decreases in ventilation level is a decrease in the initial rate of differential pressure during inspiration and expiration reflecting the degree of corticalization of control of natural mechanisms governing ventilation during muscular work. References 39: 21 Russian, 18 Western. [804-6508]

UDC 612.014.41

HYPERBARIC PHYSIOLOGY (STATUS AND PROSPECTS)

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84 (manuscript received 24 May 83) pp 659-673

ZAL'TSMAN, G. L., Leningrad

[Abstract] Hyperbaric physiology studies the reaction of the human and animal body to excess pressure. Man and animals have not been exposed to excess pressure until relatively recently in the course of evolution. Hyperbaric physiology is related both to hyperbaric medicine and to practice of diving and caisson work. A table describes extreme factors of hyperbaric environments and the response adaptive and pathologic reaction of the body, including mechanical interactions with the environment, sensomotor interactions with the environment, gas metabolism, heat exchange and other interactions. The physiological principles of survival in hyperbaric environments are discussed. The effects of hyperbaric media on pathologic processes and states of the body are described, as well as the therapeutic use of hyperbaric environments. The future prospects for development of hyperbaric physiology followed from the successful study of increasing deeper mechanisms of physiological and pathologic processes arising as men survive in hyperbaric environments. The achievements of hyperbaric physiology will in turn facilitate future successes in practical mastery of hyperbaric environments and their use for therapeutic purposes. References 22: 11 Russian, 11 Western. [804-6508]

INFLUENCE OF ACTIVATION OF ASFS-2 ON HUMAN EMOTIONAL STATUS

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 10 Mar 83) pp 674-675

MIROLYUBOV, A. V., SOLOMIN, I. L. and SHIKIN, A. Yu., Military-Medical
Academy imeni S. M. Kirov, Leningrad

[Abstract] A study was made of the reported effect of rhythmic photostimulation to moderate the severity of organic hyperkinesia such as Parkinson's disease. The change in emotional status of practically healthy persons after a series of artificial stable functional connections (ASFS-2) stimulus was studied. It was noted that during the therapeutic photostimulation hyperkinesia decrease and the mental status of the patient improves noticeably, manifested as an increase in the level of mental activity, improvement in general feeling, increase in volume of short-term memory. Studies were performed during a long cruise involving 30 sailors 19 to 41 years of age. Group 1 received a single injection of 30 mg of ethimizol i/m. Group 2 received sessions of photostimulation with a gas discharge photostimulator at 15 Hz for 5 seconds. Group 3 received the injection of ethimizol, followed 30 minutes later by photostimulation (ASFS-2). The course of ASFS-2 stimulation significantly activated and balanced the emotional state of the subjects, as a result of involvement in the artificial stable connection of the emotiogenic structures of the brain. References 5: 3 Russian, 2 Western.
[804-6508]

UDC 614.73-07

SIMULTANEOUS DETERMINATION OF RADIATION AND CONVECTION HEAT TRANSFER

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 18 Jan 84) pp 43-45

SINITSYN, A. N. and IVANOV, Yu. A.

[Abstract] Mathematical analysis was conducted on heat transfer by radiation and convection to design a relatively simple approach for determining human heat balance in situations where both factors are at play. Proceeding from the general physical laws of heat transfer, where convective transfer (q_c) is proportional to the temperature difference between body surface (T_s) and air (T_a), and radiation transfer (q_r) is proportional to the difference between T_s and mean temperature of surrounding surfaces (mean radiation temperature, T_r), the following equation can be derived $q_{rc} = q_r + q_c = (\alpha_r + \alpha_c)(T_s - RCT)$. In the equation, q_{rc} is the rate of heat exchange by radiation and convection, α_c and α_r are heat transfer coefficients between a

body and its surroundings via convection and radiation, respectively, and $RCT = \text{radio-convective temperature} = (\alpha_c T_a + \alpha_r T_r) / (\alpha_c + \alpha_r)$. On the basis of this approach, a monogram was derived that allows the determination of RCT in °C under defined conditions from readily made measurements.

Figures 1; references 12: 7 Russian, 5 Western.

[1551-12172]

UDC 629.78.: [612.8.014.49+616.8-086.865

EFFECTS OF PROLONGED HYPOKINESIA ON NERVOUS SYSTEM

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 3 Feb 84) pp 27-31

KRUPINA, T. N., professor, YARULLIN, Kh. Kh., professor, and TIZUL, A. Ya., doctor of medical sciences, Moscow

[Abstract] A variety of male volunteers were tested for the physiological consequence of extended, limited motor activity in relation to age and state of health. The experimental conditions included long periods of submersion, sensory deprivation, clinistatic and anti-orthostatic hypokinesia, etc. The systems showing the earliest signs of decompensation included the autonomic nervous system, particularly its vasomotor component, neuropsychiatric interactions, and certain metabolic processes (especially water-electrolyte balance and lipid metabolism). Other systems evidencing altered functional status were the neuroendocrine and immune systems, with the most pronounced onset of physiological imbalance becoming evident after two months of limited motor activity. These observations point to the need for a regular exercise program during space flight to maintain optimum performance during periods of restricted physical activity, and to facilitate physiological recovery once periods of inactivity are over. Underlying disease states or abnormalities exacerbate the effects of hypokinesia (or of weightlessness), and render subsequent recovery mechanisms less effective. Figures 2, references 18: 17 Russian, 1 Western.

[1544-12172]

PUBLIC HEALTH

CARE OF INDIVIDUALS DISCUSSED

Yerevan KOMMUNIST in Russian 18 Oct 84 p 2

ARUTYUNYAN, G., First Deputy of ArSSR Minister of Health

[Abstract] The principal wealth of any state is the health of the individual. The Soviet System pays attention to this problem, as exemplified in Soviet Armenia. Currently the health service in this republic includes 150 hospital institutions, 342 urban, rayon, rural ambulatoraya and polyclinic units, feldshes-midwife points and 30 dispensaries. This network is being expanded gradually in light of the directives from the Plenum of CC CPSU and in response to the letters received from the citizens at large. Attention is directed especially to the complaints about impersonal treatment of the patients and their relatives by medical staff. Many complaints come from rural areas concerning the difficulties in getting regular medical care; the Ministry responded by organizing "medical care Sundays" during which physicians go into remote areas to provide care and consultation to the populace. Another solution was based on "open days" (held on Saturdays) when any individual may approach the desired specialist in his office. Another proposed solution called for "5 days per year spent in the area where the specialist began his career." The response from the medical staff was excellent. Still another proposal concerned mobile units which were not discussed as a working solution in this paper.

[045-7813]

HEALTH CARE FOR FAR EAST INHABITANTS

Moscow MEDITSINSKAYA GAZETA in Russian 3 Oct 84 p 3

MAKAROV, V., Medical Gazette Correspondent, Khabarovsk

[Abstract] Papers presented at a session in Khabarovsk of the presidium of the USSR Academy of Medical Sciences emphasized problems related to the development of medical sciences in the Soviet Far East and recommended the introduction, there, of a program similar to the "Health of the Peoples of Siberia" program. Emphasis by medical scientists on the study of childhood diseases in the Far East is producing fundamentally new data on child development in

that area. A complex of methods for assessing the immune status of neonates and that of children with acquired birth defects is being developed. Study of the effectiveness and mechanisms of action of a new group of immune system stimulants (bioglycanes of marine invertebrates) is being emphasized. Study of climatic, balneological and recreational possibilities of the region in terms of their value as "health resources" is underway. The Baykal-Amur railroad is contributing to this by providing access to mineral therapy and mud-bath therapy sources. Emphasis is being placed on dispensary care with careful evaluation of the effect of working and living conditions on morbidity among workers in mining, coal and metallurgy and ship-building industries. Procedural and methodical aspects of prophylactic dispensarization are being developed at the USSR Academy of Medical Sciences, Siberian Department, with the aid of electronic computers. The All-Union Center of Yersinioses and Pseudotuberculoses and the Far-Eastern Pulmonological Center are being developed at the USSR Academy of Medical Sciences, Siberian Department institutions. The effect of climatic and weather conditions, environmental conditions and wildlife on incidence of morbidity is discussed. Development of a new science, pharmacosanation, work in introducing extract of eleutherococcus into medicine practice, prophylactic properties of brown sugar and work in phytotherapy are mentioned briefly.
[1536-2791]

UDC 362.1([47+57]-22)

MATERIAL AND TECHNICAL SUPPORT FOR MOBILE MEDICAL SERVICES IN RURAL AREAS

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 15 Sep 83) pp 55-58

PAKHARIN, V. I., Rostov Oblast Department of Health

[Abstract] Description is provided of the mobile medical services implemented in the Rostov Oblast to serve the rural population. In addition to preventive medicine teams, such mobile services now include disinfection, blood collection from donors, fluorography, and so forth. In 1983 alone, such mobile teams made some 9,300 trips to various rural areas from local hospitals and therapeutic/prophylactic facilities to some half a million rural residents. The duration of such trips is generally 1-2 days in areas with good roads, and 2-3 such trips are made a month. Where roads are lacking, the time required for an average trip is on the order of 5-7 days. Continuous efforts are being made to improve the service vehicles and equip them with the latest in medical diagnostic and therapeutic technology, as well as to motivate and train the appropriate health personnel. The availability of radio-equipped vehicles has been of key importance in the efficient management of the mobile medical teams. References 6 (Russian).
[1544-12172]

CARCINOGEN SUBSTANCES IN FOOD

Tallinn RAHVA HAAL in Estonian 16 Oct 84 p 3

KANN, JURI, candidate of technology, docent, food technology department,
Tallinn Polytechnic Institute

[Abstract] Foodstuffs must contain nutrients required by the body, but not harmful substances, including carcinogens. Up to 70-80 percent of cancers are thought to be caused by external factors. Dr. Higginson, long-time director of the Lyon International Cancer Center thinks that 30 percent of cancers in humans is caused by food. As early as 1979, 18 substances were listed as carcinogenic by the center. There is reason to think that the number is much higher. To date almost 7000 substances have been tested on animals, and T. Maugh claims that 1500 of these are carcinogenic. Such testing of one compound costs up to 500,000 pounds sterling. Human food consists of plant or animal material. Plants can be contaminated by air, surface, water, and also fertilizers and pesticides. Meat and dairy products are mainly contaminated by feeds, and also additives and new reactions. Considerable knowledge has been gained about the carcinogenic nature of polycyclic aromatic hydrocarbons, some heavy metals, nitrosamides, pesticides and toxins. Aromatic hydrocarbons, which are produced at high temperatures, can be found in bread, vegetables, margarine, vegetable oils, roasted coffee nuts and smoked products; very large amounts of these substances have been found in vegetables grown in industrial regions. Thus these substances occur primarily due to external pollution rather than to any intraorganic reactions. Very dangerous heavy metals that can accumulate in the body include lead, cadmium, and mercury. Usually these substances are not prevalent in vegetables, except in industrial regions and along highways where there is lead contamination in leafy vegetables and fruits along a strip 50-100 meters in width. There is major mercury content in some mushrooms that seem to gather mercury from the atmosphere. There is no major heavy metal content in meat and eggs, but there is considerable lead and cadmium in some meat products, such as liver and kidneys. Only an insignificant amount passes from feed through an animal's system into milk. There is a large amount of heavy metals in some fish. Some toxins may be carcinogenic. Their distribution is not affected by varying climate; their production is favored by high humidity, high temperature during the harvest, and by damaged seed. It is interesting that these toxins can also be transferred to animals through feed. In many countries the maximum amounts of permissible toxins have been fixed, fluctuating from 5 to 20 milligrams per kilogram. The temporary allowable limit in the USSR is 5 mg/kg. Another well-researched carcinogen group consists of nitrosamides that are produced in food processing; they appear in the course of secondary or tertiary amide reaction with nitrites. These substances are found in foods treated with nitrites (most meats) or which are smoked. Poor weather and overuse of nitrogen as fertilizer can cause high concentrations of nitrites in vegetables. Health authorities are

taking steps to reduce nitrite content. Temporary limits have been imposed for vegetables to make farmers consider the need to raise healthy foods. The food program will secure adequate nutrient supplies to the population. There will then be a need to establish a quality control system that will minimize the incidence of harmful, including carcinogenic, substances in food.

[1815-9-9240]

FIRST 'ALCOHOLICS ANONYMOUS' PROGRAM IN TAJIK SSR

Moscow TRUD in Russian 7 Sep 84 p 4

KHAMIDOV, R., Dushanbe

[Abstract] M. G. Gulyamov, Doctor of Medical Sciences, chief narcologist of the TaSSR, honored scientist of the TaSSR describes the TaSSR's first "alcoholics anonymous" program in an interview. The program provides for complete anonymity of the patient who visits special offices at narcological dispensaries late at night when the other facilities at the site are closed. A brief history of the disease is recorded under a number assigned to the patient. Treatment begins with conditioned-reflex pschotherapy and includes hypnosis and supportive measures. The personal, social and economic impact of this program is discussed. More than 1000 persons have been treated in this program. More than 57 percent of these have abstained from alcohol for more than 2 years, 80 percent have abstained for 1-2 years and 120-130 patients resumed drinking within 1 year.

[029-2791]

REDUCTION OF ERRORS IN MEDICAL DIAGNOSES

Riga NAUKA I TEKHNIKA in Russian No 9, Sep 84

SHNEPS, MANFRED, Doctor of technical sciences, professor

[Abstract] Extensive use of electronic computers is recommended as a means of reducing errors of diagnosis. The superiority of computer-assisted diagnoses over conventional medical diagnosis is supported by a study conducted at the Moscow Scientific Research Oncological Institute imeni P. A. Gertzen. A machine algorithm for differential diagnosis of peripheral lung cancer, using 82 signs and 76 symptoms (a 32 percent reduction over indicators used in conventional diagnosis), showed the high efficiency of this method in 361 cases, in comparison with diagnosis by a radiologist. Studies by an English surgeon showed that computer-assisted diagnosis of stomach disorders can reduce errors in diagnosis by 50 percent. A proposal for introduction of automatic computer-assisted screening and diagnosis complexes, such as those now being used in the LatSSR, are described and discussed. The complexes are

used to screen for ischemic heart diseases, rheumatic diseases and glaucoma. Prospects for developing automated polyclinics are discussed. A summary of the extensiveness of errors in diagnosis and their personal, social and economic costs is presented with mention of specific situations in Moscow and the USA.
[028-2791]

RADIATION BIOLOGY

UDC 616-008.949.5:546.73.02.60]-85.849.2.015.25-092.9

ENHANCED ELIMINATION OF RADIOACTIVE COBALT

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 21 Dec 83) pp 35-38

RAZUMOVSKIY, N. O. and YELATONTSEVA, N. B.

[Abstract] Ten chelating agents were tested for their effectiveness in enhancing elimination of Co-60 from outbred albino rats, following intraperitoneal administration of the radionuclide (0.7×10^4 Bq/g) and concomitant injection of the agents. Analysis of the tissue levels of Co-60 in the skeleton, liver, spleen, lungs, kidneys and muscles over an 8-day period showed that diethylenetriaminepentaacetic acid (DTPA) and 2,21-diamino-diethyl N, N, N'-tetraacetate DDET) were the most effective agents. Both preparations reduced Co-60 levels in the tissues by 90% or greater in comparison with control levels. Phosphonic analogs were far less effective, while dithiol compounds actually favored elevation of Co-60 levels in some tissues, indicating their low stability in combination with Co-60.

References 2: 1 Russian, 1 Western.

[1551-12172]

UDC 613.165.6.07

HYGIENIC ASSESSMENT OF INDUSTRIAL OPTICAL SOURCES OF RADIATION

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 30 Jan 84) pp 9-12

GVOZDENKO, L. A., Scientific Research Institute of Labor Hygiene and Occupational Diseases, Kiev

[Abstract] An assessment was conducted on the various optical sources of radiation used commercially in various settings, in order to have a baseline of comparison in dealing with potential occupational pathology. The criterion followed in establishing a classification scheme for such radiation was based on the principles outlined by the International Commission on Illumination (1963), which related a given emission spectrum to biological effects. On this basis the various lamps used in industrial

and medical situations, and other emitters or emitting processes, can be categorized into four groups. Group I consists of sources emitting largely infrared radiation, Group II encompasses emitters of infrared radiation in combination with visible and/or ultraviolet light, Group III emitters produce essential ultraviolet and visible light, while Group IV sources include the spectral emitters (heating lamps, lasers, etc.). Such a classification should direct occupational health physicians to potential problems in assessing health risks and causes of pathology in different environments. References 3 (Russian).
[1551-12172]

UDC 613.73-07:617.741-004.1:313.13]([47+57]-17)

RADIATION BACKGROUND AND INCIDENCE OF SENILE CATARACT IN FAR NORTH

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 14 Sep 83) pp 30-32

NIZHNIKOV, A. I., MIRETSKIY, G. I., RAMZAYEV, P. V. and TROITSKAYA, M. N., Leningrad Scientific Research Institute of Radiation Hygiene, RSFSR Ministry of Health

[Abstract] The incidence of senile cataract in natives and newcomers to the Murmansk Oblast was determined in reference to cumulative radiation exposure, which differed markedly for the two populations (0.5 rem/year for natives, 0.15 rem/year for newcomers). The sole exception was the pulmonary dose from radon decay, which was equivalent for the two groups. In general, natives of the Far North showed an incidence of senile cataract that exceeded that of newcomers two- to three-fold in the over-65 groups, and there was an age-related increase in the incidence in both cohorts. It was also determined that the mean age of onset in males was 65.8 years, and in females 71.5 years, i.e., a five-year difference. While further studies are being conducted to determine and define all of the environmental and other factors that contribute to the development of senile cataracts under the conditions of the Far North, the fact that the overall incidence in the native population is 1.5-fold higher points to the urgency of the situation in establishing all the risk factors for that group. References 10: 6 Russian, 4 Western.
[1551-12172]

PREVENTION BY METHIONINE OF LATE RADIATION SEQUELAE

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 20 Feb 84) pp 83-85

MIRETSKIY, G. I., DANETSKAYA, Ye. V., TROITSKATA, M. N. and RAMZAYEV, P. V., Leningrad Scientific Research Institute of Radiation Hygiene, RSFSR Ministry of Health

[Abstract] Outbred rats were used to assess the effects of supplemental methionine (140-220 mg/day), fed conjointly with Cs-137 and Sr-90 for a year, on the sequelae of internal irradiation in terms of lifetime and tumor development and onset. Administration of methionine alone was without any adverse effects under the conditions employed. Given with the radionuclides it prolonged the lifetime of the animals from 609 days (radionuclides only) to 671 days (radionuclides + 220 mg/day methionine) or to 647 days (radionuclides + 140 mg/day methionine). In addition, methionine was seen to reduce the incidence of tumors from 43.6% in the radionuclide only group, to 23.3% in the 140 mg/day group, and to 20.0% in the 220 mg/day methionine animals. In conjunction with the decrease in the incidence of tumors, the latent times for tumor onset (lymphosarcomas, adenocarcinomas, fibroadenomas, osteosarcomas) were increased by 34-203 days. Used in the doses recommended for human use by the Pharmacological Committee of the USSR Ministry of Health, methionine has been demonstrated to exert an antineoplastic effect in outbred rats. References 9: 6 Russian, 3 Western. [1551-12172]

ASSESSMENT OF BODY Pu-239 LEVELS

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 3 Jan 84) pp 85-86

DEMINA, G. A. and KHALTURIN, G. V.

[Abstract] In view of the commercial and industrial importance of Pu-239 and its inevitable access to animals and humans, Wistar rats were employed in an evaluation of the effects of physicochemical form of Pu-239, and route of administration, on organ and tissue distribution and elimination from the body of this radionuclide. Polymeric Pu(IV) (PP), Pu(VI) nitrate (PN) or Pu(IV) pentacine (PPC) were injected intramuscularly or subcutaneously, or administered into the trachea to give a dose of 111 kBq per animal. Retention at the entry site and elimination were studied on the first and 32nd

postadministration day, along with whole body blood, liver and skeletal measurements of radioactivity. The resultant data showed marked variations in retention, at the site of administration, and elimination in relation to the route of administration. PPC showed the highest rate of elimination and PP the lowest. PPC is largely eliminated via the kidneys (79.5-83.6%), with 75.7-82% excreted in the first day (46.6-65.4% during the first 2 h). In addition, PP and PN were much more rapidly eliminated when administered by the intratracheal route than when injected subcutaneously or intramuscularly, but the entire process of elimination was far less efficient than with PPC. Transition coefficients were calculated and tabulated for extrapolation, of such accumulation data, to man.

References 5 (Russian).

[1551-12172]

ECHOVIRUS INFECTION

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 26 Dec 83) pp 48-51

IL'INSKIY, Yu. A., MARCHENKO, V. I. and POPOV, V. N., Chair of Infectious Diseases, Stavropol Medical Institute

[Abstract] A brief review is provided of echovirus infections, based on both Soviet and Western literature. Coverage is accorded to the pathology and pathogenetic characteristics of the diseases, common and uncommon clinical findings, and epidemiology with emphasis on the global nature of echoviral infections. The point is made that definitive diagnosis cannot be advanced on the basis of clinical data alone, but requires laboratory tests involving tissue culture and serologic techniques. Control measures encompass both avoidance, and exposure to nonpathogenic enteroviruses that can displace pathogenic echoviruses from the gastrointestinal tract.

References 45: 21 Russian, 24 Western.

[1544-12172]

CONFERENCES

BRIEFS

FIRST-AID EQUIPMENT--The exhibition of surgical equipment at the Moscow City Scientific Research Institute of First Aid imeni N. V. Sklifosovskiy closed. The products of nine firms in the FRG and Switzerland were displayed. Diagnostic and anesthesia apparatus and various instruments were exhibited on stands. The Ozonosan instrument for treatment with ozone developed by medical men in the FRG jointly with surgeons at the Scientific Research Institute of First Aid imeni N. V. Sklifosovskiy was demonstrated for the first time in our country. The following two innovations attract visitors' attention: A Universal place for roentgenography of the patient in various positions. The operating table of the Heidelberger Firm, owing to the eight-section cover structure, enables the patient's body to assume the necessary position. "All this equipment was developed in cooperation with the leading clinics throughout the world," V. Pezelt, director of the West German MED-AG Firm, says. "It was very pleasant for us to work with Soviet specialists." /By Ye. Kuz'mina/ /Text/ /Moscow MEDITSINSKAYA GAZETA in Russian 31 Oct 84 p 4/ 11,439

FIRST SOVIET-INDIAN SYMPOSIUM--The first Soviet-Indian symposium was held at the All-Union Scientific Center of Surgery of the USSR Academy of Medical Sciences. N. N. Malinovskiy, academician of the USSR Academy of Medical Sciences, made a speech of welcome to the guests. Soviet and Indian scientists shared their research experience in the area of cardiovascular surgery, microsurgery and neurosurgery. "Academician B. V. Petrovskiy performed the first heart operation in our country," Prof G. B. Parulkar, head of the Department of Cardiovascular and Thoracic Surgery of the Medical Center in Bombay, said. "Today we are glad at the strengthening of professional contacts with the personnel of the center headed by B. V. Petrovskiy." /By I. Volodina/ /Text/ /Moscow MEDITSINSKAYA GAZETA in Russian 31 Oct 84 p 4/ 11,439

CSO: 1840/1581

MISCELLANEOUS

BRIEFS

NIGERIAN PUBLIC HEALTH DELEGATION--At the invitation of the Central Committee of the Trade Union of Medical Workers a delegation of the trade union of Nigeria's public health workers visited the USSR. During the 10-day visit A. Maygatari and E. Olagbaye, representatives of the national executive committee of the trade union, and D. Odzho, member of the trade union committee of the university clinic in the city of Zaria, visited medical institutions in Moscow, Baku and Voronezh. "I have never been in the Soviet Union," A. Maygatari said. "I have seen snow for the first time. I have met Soviet people, who received us very warmly and kindly. I admire the system of public health and free medical care in your country. I especially remember the Voronezh Oblast Clinical Hospital. This is a whole medical city provided with the latest equipment. We have also visited polyclinics, kindergartens and preventive sanatoriums and everywhere we have become acquainted with the work of trade union committees. The talks in the Central Committee of the trade union of medical workers are of great importance for our delegation. After all, in Nigeria trade union organizations are very young. As yet we do not have experience. The trade union of public health workers in the State of Kano, which I head, now has 10,000 people. As yet not all medical workers have joined the organization. A great deal has to be done. Familiarization with the practical experience of the trade union of Soviet medical workers will help us." /By Ye. Kokurina/ /Text/ /Moscow MEDITSINSKAYA GAZETA in Russian 31 Oct 84 p 4/ 11,439

USSR-MOZAMBIQUE COOPERATION--A protocol of cooperation in the area of public health for 1985-1986 between the ministries of health of the USSR and the People's Republic of Mozambique was signed. Signing this important document, S. P. Burenkov, USSR minister of health, said the following: "Our cooperation is developing dynamically and efficiently. We will continue to give help to the People's Republic of Mozambique in the training of national medical personnel and in the fight against malaria, to provide deliveries of Soviet medical equipment and instruments and to send specialists on missions." Pascoal Mocumbi, minister of health of the People's Republic of Mozambique, made a speech in reply. /By I. Luk'yanova/ /Text/ /Moscow MEDITSINSKAYA GAZETA in Russian 31 Oct 84 p 4/ 11,439

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CSO: 1840/1581

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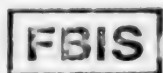
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7 January 1985

USSR Report

LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES



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7 January 1985

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LIFE SCIENCES
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BIOCHEMISTRY

PROGRESS IN BIOLOGY, MEDICINE

Moscow LENINSKOYE ZNAMYA in Russian 27 Sep 84 p 3

LIKHTENSHTEYN, G., Laboratory Chief, Division of Institute of Chemical Physics, USSR Academy of Sciences, doctor of chemical sciences, professor, Laureate of the USSR State Prize, Chernogolovka

[Abstract] Each era of human development has its own peculiar "brand." The most recent developments in the science are in the area of molecular biology. Biological systems are highly organized, with complex chemical and physical processes. Many important biological processes involve compounds containing unshared electrons: free radicals and ions. Back in the 50's, Professor L. A. Blyumenfel'd proposed a new method for studying the processes involving such unshared electrons: electronic paramagnetic resonance (EPR) based on absorption of ultrahigh frequency electromagnetic field by compounds containing unshared electrons. The scientific staff at the Institute of Chemical Physics, USSR Academy of Sciences contributed largely to achievements in this field in their attempt to win the USSR State Prize: adaptation of EPR to biological systems, work at super low temperatures, involvement of computers, studies of the effect of UV irradiation, changes in the paramagnetism of the endocrine glands, work in a new type of paramagnetic resonance on complexes of iron with nitrogen oxides, etc.

[048-7813]

UDC 577.154

IMMOBILIZATION OF RAT LIVER MICROSOMAL FRACTION

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 278, No 1, Sep 84
(manuscript received 5 Dec 83) pp 233-236

DAVIDENKO, T. I., SEVAST'YANOV, O. V., POMOGAYLO, A. D. and BOGATSKIY, A. V. (deceased), academician, Ukrainian SSSR Academy of Sciences, Physicochemical Institute, Ukrainian SSR Academy of Sciences, Odessa

[Abstract] Polyacrylamide gel (PAAG) and polyethylene grafts (PEG) were tested for their suitability in immobilizing the microsomal fraction

prepared from rat hepatocytes. PAAG was found unsuitable for the preparation of immobilized microsomal fractions due to excessive loss of mono-oxygenase activity. Superior results were obtained with PEG with polyacrylic acid with graft:polyethylene ratio of 1:8 to 1:12, with immobilization conducted at 5°C for 24/h. On storage the preparations were stable for 4 weeks at 5°C and retained ca. 110% of original activity at pH 7.6. Optimum mono-oxygenase activity was obtained at 50°C with aniline substrate and at 37°C with dimethylaniline substrate. High levels of mono-oxygenase activities were also retained by preparations involving PEG with polyallyl alcohol, yielding immobilized preparations that were stable for 6 months at 4-5°C, and retained 20% of original enzyme activity at the end of the storage period. References 6: 3 Russian, 3 Western.
[037-12172]

UDC 577.15.08+577.112.4+541.182.6

ENZYME MODIFICATION BY WATER-INSOLUBLE REAGENTS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 278, No 1, Sep 84
(manuscript received 3 Feb 84) pp 246-248

LEVASHOV, A. V., KABANOV, A. V., KHMEL'NITSKIY, Yu. L., BEREZIN, I. V., corresponding member, USSR Academy of Sciences, and MARTINEK, K., Moscow State University imeni M. V. Lomonosov

[Abstract] Alpha-chymotrypsin was employed as a test protein to determine optimum conditions under which enzymes and, by extension, other proteins could be rendered hydrophobic, to some extent, by modification with water-insoluble reagents. Successful acylation of chymotrypsin was obtained by employing the wetting agent docusate sodium (Aerosol OT, Merck), which facilitated acylation at mycellar surface. To 10 ml of 0.01 M docusate sodium in octane was added 0.45 ml of chymotrypsin (3-5 mM in 0.02 M phosphate buffer, pH 8.5), followed by the addition of ca. 100 μ L of stearyl chloride (0.1 M in docusate sodium/octate). The mixture was mixed and stored overnight at room temperature. The protein was recovered by the addition of 10-fold volume of cold acetone, yielding a recovery of 95-97%. Sedimentation patterns revealed no protein aggregation, and gel filtration on Sephadex G-50 indicated 80% yield of acylated enzyme with 1-2 stearyl groups per molecule. Such preparations retained 60% of original enzymatic activity, and suggested that other proteins can be so modified under similar conditions. Figures 1; references 11: 3 Russian, 8 Western.
[037-12172]

BIOPHYSICS

BOOK: GENERATION, DISPERSION OF AUTOWAVES

Moscow AVTOVOLNY (NOVOYE V ZHIZNI, NAUKE, TEKHNIKE: SERIYA "FIZIKA") No 10, 1984 in Russian (signed to press 5 Sep 84) p 2

[Annotation and table of contents from book by V. I. Krinskiy, doctor of physical-mathematical sciences and Lenin prize laureate, and A. S. Mikhaylov, candidate in physical-mathematical sciences: "Autowaves", Moscow, Znaniye, 1984, 64 pages, 33,500 copies]

[Text] Annotation

The brochure examines questions associated with the dispersion of autowaves-- generation waves in active media with dissipation and boosting of energy. The properties of autowaves are discussed, as well as the processes of interaction between them and the action mechanisms of autowave sources. Autowave processes in biologically active media--in cardiac tissue and in the cerebral cortex--are explained. Results of experiments on the study of autowaves with the Belousov-Zhabotinskiy reaction are presented. The prospects for application of autowave effects in electronic technology are examined.

The brochure is intended for a wide range of readers interested in the achievements of modern physics and biophysics.

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CSO: 1840/053

ENVIRONMENT

UDC 614.7:622.332(571.51)

ENVIRONMENTAL HEALTH IN INDUSTRIAL DEVELOPMENT IN KANSKACHINSK FUEL, ENERGY COMPLEX AREA

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 30 Jul 82) pp 7-9

SHITSKOVA, A. P., BORISENKOVA, R. V., GIL'DENSKIOL'D, R. S., PLITMAN, S. I., KRASNOPEVTSEV, V. M., STEPANOV, L. G., TITKOVA, N. N., ABRAMOVA, E. M. and BLOKHINA, L. M., Moscow Scientific Research Institute of Hygiene imeni F. F. Erisman; Krasnoyarsk Kray Sanitary Epidemiologic Station

[Abstract] An environmental and hygienic assessment was conducted in the Kansk-Achinsk industrial region, which promises to be one of the leading sources of fuel energy for Siberia. All-encompassing studies on environmental health and ecological impact of the industrial development have shown the absence of any major adverse effects, and a generally satisfactory state of affairs. For example, within the site of the Nazarov power station, sulfur dioxide, nitrogen oxide and dust levels do not pose a threat to man or nature; however, some thermal effects have been noted on the aquatic flora. Relatively good indicators of occupational health prevail in the various mining operations. Cardiovascular diseases were the leading cause of morbidity (18.2%), followed in importance by disorders of the peripheral nervous system (13.9%), gastrointestinal pathology (10.9%) and respiratory diseases (10.3%). Analysis of food supplies and dietary practices in the vicinity of the Nazarov power plant indicated that the nutritional status in the area is satisfactory. [1551-12172]

HYGIENIC MONITORING OF DOMESTIC WATER SUPPLIES FROM IRRIGATING SYSTEMS IN UZBEKISTAN

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 29 Feb 84) pp 68-69

IL'INSKIY, I. I., ISKANDAROV, T. I., BAKHRETDINOV, Sh. S. and USMANOV, I. A.
Scientific Research Institute of Sanitation, Hygiene and Occupational
Diseases, Uzbek SSR Ministry of Health, Tashkent

[Abstract] A discussion is presented in general terms of the problems of safe domestic water in Uzbekistan, most of which is derived from irrigating systems. In general, high quality water is obtained in accordance with GOST standards. However, continuous monitoring is required because of equipment failure at water-treatment plants, particularly during the hot seasons, and the possibility of reservoir pollution under the climatic conditions prevalent in Uzbekistan. In addition, special attention must be accorded to chlorination procedures and the monitoring of chlorine levels, especially since overchlorinated water has been shown to have carcinogenic potential.

[1551-12172]

UDC 613.281:6;3.22

BIOLOGICAL EVALUATION OF NEW MEAT PRODUCTS FOR PEDIATRIC AND DIETETIC NUTRITION

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 16 Dec 83) pp 12-14

KHOVAYEVA, L. A., TEREKHIN, S. P. and AFANAS'YEVA, N. A., First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] A biological evaluation was conducted of new canned meat products intended for children and as dietary supplements. Using albino rats, the products were evaluated in reference to the various technical steps involved in the preparation (thermal treatment, substitution of vegetable oils for animal fats, dairy and vegetable additives, etc.). Analysis of the various factors led to identification of acceptable and unacceptable additives and substituents that may be used in the canned chicken and beef products. For example, it has been demonstrated that one of the common additives in pediatric products, starch, diminished the nutritive value for rat weanlings, resulting in decreased weight and accumulation of liver lipids. In addition, during heating, the various starch products may react with proteins leading to the formation of polycondensation products and eliminating 20-50% of the free amino acids in the food. The polycondensation products themselves may exert toxic effects on the liver and generative organs. These observations point to the need for constant monitoring of food products, particularly those designed for children, to ensure the manufacture of the highest quality nutrient. References 9 (Russian).
[1551-12172]

SAFETY EVALUATION OF OZONE TREATMENT FOR PROLONGING STORAGE OF AGRICULTURAL PRODUCTS

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 24 Jan 84) pp 15-17

BUSLOVICH, S. Yu., BAGEL', I. M., BOGDAN, A. S., DUBENETSKAYA, M. M., YENSHINA, A. N., KOLDOBSKAYA, F. D. (deceased) and CHUYKO, M. P., Belorussian Scientific Research Sanitary Hygiene Institute, Minsk

[Abstract] Ozone was evaluated as a preservative for potatoes under several conditions of preservation or storage, to evaluate the rate and dose of application. Chemical analysis of the treated potatoes and toxicity studies on weanling rats showed that ozone per se had no adverse effects on the potatoes in the optimum dose range of 20-40 mg/m³, with 4 h exposures for 25 treatments. Similarly, when tested on the rats within 18 h of treatment no organoleptic effects were evident. The latter was also confirmed by a lack of any biological consequences on Tetrahymena. While ozone appears to be entirely safe when used to prolong storage life of potatoes, other agricultural products will have to be analyzed on an individual basis to determine the spectrum of application of ozone in the preservation of agricultural products. References 7 (Russian). [1551-12172]

UDC 612.766.1-087:519.24(049.2)

POSSIBILITY OF INTEGRATED FATIGUE ASSESSMENT

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 16 Dec 83) pp 58-59

ROSENBLAT, V. V., Ural Institute of Forest Technology imeni Komsomol, Sverdlovsk

[Abstract] The article by Kutsenko et al. [Kutsenko, GI, et al., Gig. i. San., No 8:53-55, 1982] on integrative evaluation of fatigue has stirred considerable controversy, since it represents an attempt at quantification of both subjective and objective factors. A positive aspect in their work is the use of a set of indicators to assess gradual changes in various parameters. However, the use of regression analysis and standard scale units (and their averages) seems dubious, since an overload of one functional system and its relative inefficiency is not necessarily compensated for by other systems that may be underutilized. A relatively simple equation is suggested for the contribution of various indices to an overall index having a standard scale of 100. In the latter approach, minor indicators of fatigue are related to major indicators, and their relative contribution can be estimated. References 8: 6 Russian, 2 Western.
[1551-12172]

LASER EFFECTS

UDC 616.839-085.849.19

LASER TREATMENT OF PERIPHERAL NERVOUS DISEASES

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 29 Jun 83) pp 100-104

DURINYAN, R. A., ANISHCHENKO, G. Ya., KOCHETKOV, V. D. and YEVTIFEYEVA, Ye.S., Central Scientific Research Institute of Reflexotherapy, Main Public Health Administration, Moscow City Executive Committee

[Abstract] The clinical effectiveness of helium-neon laser ($10-20 \text{ mW/cm}^{-2}$, total energy $0.5-2 \text{ J/cm}^2$ after 10-12 treatments; repeated in 15 days if needed) was tested on 487 patients, 17 to 70 years old, with the radicular syndrome, trigeminal neuralgia, or alcoholic or diabetic polyneuropathy or polyneuritis. Evaluation of the clinical results indicated that marked improvement was noted in 34 of 68 patients with trigeminal neuralgia, and in 40 of 59 subjects with alcoholic or diabetic polyneuropathy. On an overall basis, satisfactory results were obtained in a total of 148 of the patients, the disease process was unaffected in 43, and deterioration was observed in three cases. Concomitant analysis of EKGs, EEGs and EMGs showed that laser puncture did not involve any systemic effects and, consequently, that low-dose helium-neon laser irradiation can yield positive results in some cases of peripheral nerve neuropathy. References 9 (Russian). [1544-12172]

MARINE MAMMALS

MENTAL PROCESSES OF DOLPHINS, MAN

Moscow NEDELYA in Russian No 39 (1279) Sep 84 p 5

KORAROVITSKIY, LEONID

[Abstract] A review is presented of the film "Man and Dolphins," the article discusses some aspects of dolphin mental processes in comparison with those of man. Using A. N. Severtsov's hypothesis concerning the existence of a "reserve mind" in animals, Kozarovitskiy describes this process as a totally different process from that existing in man. In spite of many biological similarities in the mental functions of man and animals, a significant difference is found in man's engaging in social labor, abstract thought, consciousness, self-consciousness, etc. Nest building by birds and bird song are not analogous to similar actions performed by man. Animals have only the biological prerequisites of intellectual activity pursued by man, hence animal behavior should be studied as "animals in the animal world and man in man's world." Kozarovitskiy debunks many stories concerning human-like activities of dolphins. He praises the film for its warmth and tenderness and its message that all living things need love.
[027-2791]

MEDICINE

UDC 616.24-002.5-06:616.89-008.441.13-036.12]-085.281.873.21-06

SIDE EFFECTS OF ANTITUBERCULOSIS DRUGS IN CHRONIC ALCOHOLICS WITH PULMONARY TUBERCULOSIS

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 10 Nov 83) pp 7-10

RUDOY, N. M., Professor, and CHUBAKOV, T. Ch., Dispensary Department, Central Scientific Research Tuberculosis Institute, USSR Ministry of Health, Moscow

[Abstract] Nine antitubercular drugs were assessed for side effects in 186 patients with pulmonary tuberculosis, for comparison with a 266 patient cohort with chronic alcoholism. The study excluded allergic responses. Two-thirds of the patients with tuberculosis and alcoholism tolerated the chemotherapy poorly, as indicated by development of gastrointestinal, cardiovascular and neuropsychiatric symptomatology. The incidence of toxic side effects was 1.5-times higher in the chronic alcoholics. The reactions and incidence was particularly pronounced with cycloserine and rifampin, accounting for 66.6 and 21.9% of all the cases of toxicity, respectively. Rifampin and cycloserine can, therefore, be regarded as being contraindicated in the management of chronic alcoholics with pulmonary tuberculosis. Furthermore, since manifestations of side effects often mimic those of withdrawal symptoms, clinical observations for evidence of toxicity are best limited to periods of abstinence. References 9: 7 Russian, 1 Polish, 1 Western.
[1544-12172]

MANAGEMENT OF DELIRIUM TREMENS

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 13 Apr 83) pp 96-100

TSELIBEYEV, B. A., professor, and ROYZENVASSER, A. S., All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serskiy; Psychosomatic Department, No 1 Municipalr Clinic imeni N. I. Pirogov

[Abstract] A brief review is presented on the chemotherapeutic management of delirium tremens, with consideration of the various somatic manifestations that may accompany such a state. Considerable clinical acumen has to be exercised in treatment of such patients, particularly where there is no reliable medical history, or where a patient denies being an alcoholic. Recommended doses are given, with caution about individual conditions, and emphasis is placed on keeping a high index of suspicion for infectious diseases. References 7: 4 Russian, 3 Western
[1544-12172]

BIOLOGICAL CHARACTERISTICS OF HALOPHILIC METHANOGEN ISOLATED FROM OIL FIELD

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 278, No 1, Sep 84
(manuscript received 3 May 84) pp 227-230

OBRAZTSOVA, A. Ya., SHIPIN, O. V., BELYAYEV, S. S. and IVANOV, M. V.,
corresponding member, USSR Academy of Sciences, Institute of Biochemistry and
Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow
Oblast

[Abstract] Isolation studies on high-salt solid media led to the isolation of a novel methanogen from the No 283 Bondyuzhskiy oil field. On mineral medium No 15, with 70 g/liter salt content, round, concave colonies developed that reached a diameter of 1 mm in 15 days. The colonies were pale yellow in color, giving green fluorescence under UV light, and consisted of irregular coccoid forms (0.8-1.5 μ m). Growth and methane formation occurred at 15-50°C at pH 5.9-8.2. The optimum temperature and pH ranges for growth and methanogenesis were 28-37°C and 6.8-7.3, respectively. Growth tolerated an NaCl concentration ranging from 100-140 g/liter, but with an optimum at 60 g/liter. Observations of other characteristics and a G+C value of 43.0 mol% indicated that the new isolate belongs to the *Methanococcus* genus, and has been designated as *M. euhalobius*. Figures 2; references 12: 5 Russian, 7 Western.
[037-12172]

NONIONIZING ELECTROMAGNETIC RADIATION

UDC 613.647

SAFETY ASSESSMENT METHODOLOGY FOR TWO-FREQUENCY ELECTROMAGNETIC FIELD COMBINATIONS

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 2 Sep 83) pp 38-42

DUMANSKIY, Yu. D., IVANOV, D. S., NIKITINA, N. G., KARACHEV, I. I., BITKIN, S. V. and SOLDATCHENKOV, V. N., Kiev Scientific Research Institute of General and Communal Hygiene imeni A. N. Marzeyev

[Abstract] Mathematical analysis was conducted on the risk posed by exposure to electromagnetic fields of different frequencies by deriving equations for estimating permissible exposures. The results demonstrated that a combination of two fields with different frequencies, including alternations of exposure, must be evaluated for each frequency. A functional relationship between the two fields must be determined using parameter 'd', where d represents the ratio of the power flux densities of the two frequencies in question. The parameter d, then, is a characteristic attribute of the total field that facilitates construction of graphic plots for the estimation of the maximum permissible intensity for each frequency. Figures 2; references 3 (Russian).
[1551-12172]

UDC 613.644/.647]-07:612.017.1.014.44/.45

IMMUNOLOGICAL CRITERIA IN RISK ASSESSMENT OF NONIONIZING RADIATION

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 25 Oct 83) pp 52-56

BATANOV, G. V. and TRIFONOV, S. I.

[Abstract] A survey is presented of the use of immunological criteria in determining safety limits for nonionizing radiation, in view of occupational, medical and background exposure to various sources of electromagnetic radiation. Many components of the immune system have been shown to be very labile

to various external factors and, although experimental and clinical data are quite limited, nonionizing radiation has been demonstrated to affect certain components. For example, irradiation with low power flux density microwaves (to 1 mW/cm²) has been shown to enhance certain specific and nonspecific immune responses, while microwaves in the 1-10 mW/cm² range have been shown to be immunosuppressive. In addition, therapeutic-intensity argon, cadmium, helium-neon and chemical HF lasers have been shown to alter serum immunoglobulin levels and antibody reactivity. Other factors of the immune system found susceptible to nonionizing radiation include phagocytic activity, immune cell function, complement activity, antibody formation, etc. In all, these observations indicate that the immune system is a serious contender for the status of an indicator in assessing the physiological effects of nonionizing radiation. References 30: 25 Russian, 5 Western.

[1551-12172]

UDC 616.15 057-02:613.632.4:615.285.7

RED CELL EFFECTS FOLLOWING LONG-TERM OCCUPATIONAL EXPOSURE TO PESTICIDES

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 21 Nov 83) pp 105-108

ROMASH, A. V., candidate of biological sciences, LADNOVA, G. G., doctor of medical sciences, and DOROFYEV, V. M., Laboratory of Toxic Chemicals, All-Union Scientific Research Institute for Agricultural Occupational Safety, USSR Ministry of Agriculture, Orel

[Abstract] Various red blood cell values were determined in a group of 575 male and female agricultural workers exposed to pesticides for long periods of time, for comparison with similar parameters obtained for control donors. In comparison with the control values, the exposed individuals were characterized by hematologic changes that included depressed hemoglobin levels, reduced erythrocyte counts, diminished hematocrits, increased color index, enhanced ESR, increased levels of reticulocytes, etc. These changes were related in their degree to the duration of exposure, and compatible with a progressive course of chronic anemia. The changes, reflective of the underlying pesticide-induced pathology, were more pronounced in women than in the male workers. These observations suggest that regular monitoring of the hematologic status may provide an early indication of pesticide toxicity in the group at risk. References 23: 21 Russian, 2 Western.
[1544-12172]

CREATORS OF NEW SUBSTANCES

Moscow IZVESTIYA in Russian 19 Sep 84 p 3

EMANUEL', N., academician, Lenin Prize Laureate, State Prize Laureate

[Abstract] Experimental production of analogs which greatly exceed the therapeutic effects of penicillin was described. Isolation of 6-aminopenicillanic acid, the nucleus of penicillin, provided a base for synthesis of large numbers of new antibiotics if large-scale production of this compound can be achieved. A method of selective conversion of 6-aminopenicillanic acid was

discussed. The method involves reactions which go at room temperature in an aqueous solution. This achievement required collaboration of geneticists, microbiologists, biochemists, physicists, chemists, mathematicians and engineers, including scientists from the All-Union Scientific Research Institute of Antibiotics, Moscow State University imeni M. V. Lomonosov, Tallinn Polytechnic Institute, Riga and Saransk medical preparations plants and "Mosmedpreparaty" Production Association. Automation of production of this compound improves work conditions and reduces labor-intensiveness 5-fold with savings of raw material 5-fold in comparison with other methods of production. This production layout is superior to similar procedures developed later abroad. Development of a second industrial process, development of a "nucleus" of cephalosporins, also cannot be duplicated abroad. The economic impact of development of these processes is discussed.

[025-2791]

UDC 612.014.4

INFLUENCE OF GEOMAGNETIC DISTURBANCES ON CARDIOVASCULAR FUNCTION OF ATHLETES

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 13 May 83) pp 640-646

RYZHIKOV, G. V. and DZHEBRAILOVA, T. D., Institute of Normal Physiology imeni P. K. Anokhin, USSR Academy of Medical Sciences, Moscow

[Abstract] Eleven men 20 to 30 years of age from a rifle firing team took part in the study. EKG and arterial pressure studies were performed before and after training and competition. The variation coefficient of R-R interval, index of intensity and autonomic index were recorded. The results produced were compared with studies of the degree of disturbance, presence of magnetic storms and their force and values of K intensity index for the time period. Studies were performed daily over 3 training periods between February of 1981 and May of 1981. On days of magnetic disturbance there was a decrease in sports results. In terms of the degree of this decrease, the athletes can be divided into those resistant to magnetic disturbances, relatively resistant and nonresistant. The increase in sympathetic influences on cardiac activity during geomagnetic disturbances was observed in those cases when the autonomic index was initially close to zero, particularly when magnetic storms began suddenly. Athletes with strong sympathetic influence on cardiac activity were more resistant to the effects of geomagnetic storms. References 15: 13 Russian, 2 Western.
[804-6508]

UDC 612.825+612.843.7

FUNCTIONAL INTER-HEMISPHERE ASYMMETRY IN RECOGNITION OF VISUAL STIMULI OF VARIOUS CLASSES

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 25 May 83) pp 578-588

UDALOVA, G. P., KASHINA, I. A., Leningrad State University imeni A. A. Zhdanov

[Abstract] A study was performed to determine the variation in degree of hemisphere dominance as a function of the class of visual stimuli and time

parameters of their presentation, nature of the visual task, specifics of motor reaction, as well as sex of test subjects. The stimuli used can be considered verbalizable to some extent and can be identified primarily by means of concrete or abstract characteristics. The work utilized a set of achromatic slides with 5 classes of stimuli: abstract words, images of 6 pitchers with asymmetrical shapes, images of 6 bugs, faces of 12 young men without emotional expression, and faces of 2 young women with various highly emotional expressions. Studies were performed on 50 healthy test subjects of both sexes. Processing of the experimental material indicated the presence upon visual recognition of a certain variation of the direction and degree of manifestation of functional inter-hemisphere asymmetry as a function of the level of verbal processing of the images presented, the degree of utilization of abstract and concrete characteristics of the stimulus, its emotional coloration, time parameters of stimulation, specifics of implementation of motor reaction and sex of the test subjects. These factors should be considered when visual stimuli are used in clinical practice as tests for topic diagnosis of brain image. Figures 3; references 24: 5 Russian, 19 Western.
[804-6508]

UDC 612-08:62

ENCEPHALOGRAPHIC CORRELATES OF AUTOGENOUS CHANGE IN HUMAN FUNCTIONAL STATE

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 7 Apr 83) pp 594-596

ANTONOV, A. A., Moscow

[Abstract] A study was made of the influence of respiratory exercises used to optimize physical condition before sports contests on the functioning of the central nervous system. Twelve healthy men 28 to 35 years of age were studied in a light-and-sound-insulated chamber in the morning hours. Each subject was studied 4 times at intervals of 6 to 12 days. The MMPI test was used to evaluate the emotional-mental state before each session. EEG were recorded bipolarly in two leads from the left hemisphere with a time constant of 0.1 over 400 seconds in each stage of the study. The breathing exercises caused a change in the level of spatial synchronization of bioelectric activity of the frontal-temporal and temporal-occipital segments of the cerebral cortex. Depending on the initial emotional-mental state of the subjects, breathing exercises caused an increase in reduced or a decrease in elevated levels of spatial synchronization of bioelectric activity in these areas of the cortex. References 7: 6 Russian, 1 Western.
[804-6508]

DYNAMICS OF EXTERNAL RESPIRATION AND GAS METABOLISM UNDER COMBINED EFFECT OF HYPOXIA AND HYPERCAPNIA

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 15 Nov 82) pp 610-616

AGADZHANYAN, N. A., BRAGIN, L. Kh., DAVYDOV, G. A. and SPASSKIY, Yu. A.,
Moscow

[Abstract] Two series of experiments were performed involving 20 practically healthy men 20 to 30 years of age. One series of studies was performed in the plains, another in the mountains of central Tyan'-Shan at an altitude of 3200 m. In studies of series IA after breathing air the subjects were shifted each 15 minutes to breathing of normoxic gas mixtures with partial carbon dioxide pressure 19, 38 and 57 mmHg. In series IB-D the partial pressure of oxygen was decreased in stages to 130, 100 and 70 mmHg. In series IIA, B, the pO_2 corresponded to the oxygen content in the surrounding mountain air, 105-110 mmHg, while pCO_2 was increased to 19 and 38 mmHg, since 57 mmHg caused dyspnea. All studies were performed at rest in a seated position, except IIB, in which the test subjects performed light work, 60 kgm/min, on a bicycle ergometer. The experiments showed that a change in the number of physiological indices upon development of hypercapnia during various stages of mountain adaptation at rest are retained under moderate physical loading. Three weeks' adaptation to high mountain conditions is accompanied by a number of functional changes leading to improvement of the tolerance for high concentrations of carbon dioxide, up to 38 mmHg. References 17: 11 Russian, 6 Western.
[804-6508]

FACTORS DETERMINING EFFECTIVENESS OF VOLUNTARY DECREASE IN VENTILATION DURING MUSCULAR WORK USING INSTRUMENTED FEEDBACK

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 7 Apr 83) pp 623-630

KUCHKIN, S. N., Institute of Physical Culture, Volgograd

[Abstract] Studies were performed on 8 practically healthy subjects 17 to 18 years of age with respiratory function and aerobic productivity corresponding to the normal for their age. The subjects performed three levels of loads on a bicycle ergometer. The first level was simple rotation of the pedals, the other two were selected to produce rates of 100-120 per minute and 150-170 per minute. The respiration pattern was recorded with a complex spiropgraphic installation with automatic gas mixture feed. Voluntary reduced

levels of ventilation are possible within a range of 60 to 80% of the background level and limited by the imperative respiratory stimulus caused by progressive hypercapnia. The factors determining the effectiveness of voluntary reductions in ventilation are defined. Subjects with hypo- and isocapnic type of hyperpnea and normo- and tachypnoic type of basal respiration pattern most effectively control ventilation. One important criterion for increasing the effectiveness of voluntary decreases in ventilation level is a decrease in the initial rate of differential pressure during inspiration and expiration reflecting the degree of corticalization of control of natural mechanisms governing ventilation during muscular work. References 39: 21 Russian, 18 Western. [804-6508]

UDC 612.014.41

HYPERBARIC PHYSIOLOGY (STATUS AND PROSPECTS)

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 24 May 83) pp 659-673

ZAL'TSMAN, G. L., Leningrad

[Abstract] Hyperbaric physiology studies the reaction of the human and animal body to excess pressure. Man and animals have not been exposed to excess pressure until relatively recently in the course of evolution. Hyperbaric physiology is related both to hyperbaric medicine and to practice of diving and caisson work. A table describes extreme factors of hyperbaric environments and the response adaptive and pathologic reaction of the body, including mechanical interactions with the environment, sensomotor interactions with the environment, gas metabolism, heat exchange and other interactions. The physiological principles of survival in hyperbaric environments are discussed. The effects of hyperbaric media on pathologic processes and states of the body are described, as well as the therapeutic use of hyperbaric environments. The future prospects for development of hyperbaric physiology followed from the successful study of increasing deeper mechanisms of physiological and pathologic processes arising as men survive in hyperbaric environments. The achievements of hyperbaric physiology will in turn facilitate future successes in practical mastery of hyperbaric environments and their use for therapeutic purposes. References 22: 11 Russian, 11 Western. [804-6508]

INFLUENCE OF ACTIVATION OF ASFS-2 ON HUMAN EMOTIONAL STATUS

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 4, Jul-Aug 84
(manuscript received 10 Mar 83) pp 674-675

MIROLYUBOV, A. V., SOLOMIN, I. L. and SHIKIN, A. Yu., Military-Medical
Academy imeni S. M. Kirov, Leningrad

[Abstract] A study was made of the reported effect of rhythmic photostimulation to moderate the severity of organic hyperkinesia such as Parkinson's disease. The change in emotional status of practically healthy persons after a series of artificial stable functional connections (ASFS-2) stimulus was studied. It was noted that during the therapeutic photostimulation hyperkinesia decrease and the mental status of the patient improves noticeably, manifested as an increase in the level of mental activity, improvement in general feeling, increase in volume of short-term memory. Studies were performed during a long cruise involving 30 sailors 19 to 41 years of age. Group 1 received a single injection of 30 mg of ethimizol i/m. Group 2 received sessions of photostimulation with a gas discharge photostimulator at 15 Hz for 5 seconds. Group 3 received the injection of ethimizol, followed 30 minutes later by photostimulation (ASFS-2). The course of ASFS-2 stimulation significantly activated and balanced the emotional state of the subjects, as a result of involvement in the artificial stable connection of the emotiogenic structures of the brain. References 5: 3 Russian, 2 Western.
[804-6508]

SIMULTANEOUS DETERMINATION OF RADIATION AND CONVECTION HEAT TRANSFER

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 18 Jan 84) pp 43-45

SINITSYN, A. N. and IVANOV, Yu. A.

[Abstract] Mathematical analysis was conducted on heat transfer by radiation and convection to design a relatively simple approach for determining human heat balance in situations where both factors are at play. Proceeding from the general physical laws of heat transfer, where convective transfer (q_c) is proportional to the temperature difference between body surface (T_s) and air (T_a), and radiation transfer (q_r) is proportional to the difference between T_s and mean temperature of surrounding surfaces (mean radiation temperature, T_r), the following equation can be derived $q_{rc} = q_r + q_c = (\alpha_r + \alpha_c)(T_s - RCT)$. In the equation, q_{rc} is the rate of heat exchange by radiation and convection, α_c and α_r are heat transfer coefficients between a

body and its surroundings via convection and radiation, respectively, and $RCT = \text{radio-convective temperature} = (\alpha_c T_a + \alpha_r T_r) / (\alpha_c + \alpha_r)$. On the basis of this approach, a monogram was derived that allows the determination of RCT in °C under defined conditions from readily made measurements.

Figures 1; references 12: 7 Russian, 5 Western.

[1551-12172]

UDC 629.78.: [612.8.014.49+616.8-086.865

EFFECTS OF PROLONGED HYPOKINESIA ON NERVOUS SYSTEM

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 3 Feb 84) pp 27-31

KRUPINA, T. N., professor, YARULLIN, Kh. Kh., professor, and TIZUL, A. Ya., doctor of medical sciences, Moscow

[Abstract] A variety of male volunteers were tested for the physiological consequence of extended, limited motor activity in relation to age and state of health. The experimental conditions included long periods of submersion, sensory deprivation, clinistatic and anti-orthostatic hypokinesia, etc. The systems showing the earliest signs of decompensation included the autonomic nervous system, particularly its vasomotor component, neuropsychiatric interactions, and certain metabolic processes (especially water-electrolyte balance and lipid metabolism). Other systems evidencing altered functional status were the neuroendocrine and immune systems, with the most pronounced onset of physiological imbalance becoming evident after two months of limited motor activity. These observations point to the need for a regular exercise program during space flight to maintain optimum performance during periods of restricted physical activity, and to facilitate physiological recovery once periods of inactivity are over. Underlying disease states or abnormalities exacerbate the effects of hypokinesia (or of weightlessness), and render subsequent recovery mechanisms less effective. Figures 2, references 18: 17 Russian, 1 Western.

[1544-12172]

PUBLIC HEALTH

CARE OF INDIVIDUALS DISCUSSED

Yerevan KOMMUNIST in Russian 18 Oct 84 p 2

ARUTYUNYAN, G., First Deputy of ArSSR Minister of Health

[Abstract] The principal wealth of any state is the health of the individual. The Soviet System pays attention to this problem, as exemplified in Soviet Armenia. Currently the health service in this republic includes 150 hospital institutions, 342 urban, rayon, rural ambulatoraya and polyclinic units, feldshes-midwife points and 30 dispensaries. This network is being expanded gradually in light of the directives from the Plenum of CC CPSU and in response to the letters received from the citizens at large. Attention is directed especially to the complaints about impersonal treatment of the patients and their relatives by medical staff. Many complaints come from rural areas concerning the difficulties in getting regular medical care; the Ministry responded by organizing "medical care Sundays" during which physicians go into remote areas to provide care and consultation to the populace. Another solution was based on "open days" (held on Saturdays) when any individual may approach the desired specialist in his office. Another proposed solution called for "5 days per year spent in the area where the specialist began his career." The response from the medical staff was excellent. Still another proposal concerned mobile units which were not discussed as a working solution in this paper.

[045-7813]

HEALTH CARE FOR FAR EAST INHABITANTS

Moscow MEDITSINSKAYA GAZETA in Russian 3 Oct 84 p 3

MAKAROV, V., Medical Gazette Correspondent, Khabarovsk

[Abstract] Papers presented at a session in Khabarovsk of the presidium of the USSR Academy of Medical Sciences emphasized problems related to the development of medical sciences in the Soviet Far East and recommended the introduction, there, of a program similar to the "Health of the Peoples of Siberia" program. Emphasis by medical scientists on the study of childhood diseases in the Far East is producing fundamentally new data on child development in

that area. A complex of methods for assessing the immune status of neonates and that of children with acquired birth defects is being developed. Study of the effectiveness and mechanisms of action of a new group of immune system stimulants (bioglycanes of marine invertebrates) is being emphasized. Study of climatic, balneological and recreational possibilities of the region in terms of their value as "health resources" is underway. The Baykal-Amur railroad is contributing to this by providing access to mineral therapy and mud-bath therapy sources. Emphasis is being placed on dispensary care with careful evaluation of the effect of working and living conditions on morbidity among workers in mining, coal and metallurgy and ship-building industries. Procedural and methodical aspects of prophylactic dispensarization are being developed at the USSR Academy of Medical Sciences, Siberian Department, with the aid of electronic computers. The All-Union Center of Yersinioses and Pseudotuberculooses and the Far-Eastern Pulmonological Center are being developed at the USSR Academy of Medical Sciences, Siberian Department institutions. The effect of climatic and weather conditions, environmental conditions and wildlife on incidence of morbidity is discussed. Development of a new science, pharmacosanation, work in introducing extract of eleutherococcus into medicine practice, prophylactic properties of brown sugar and work in phytotherapy are mentioned briefly.
[1536-2791]

UDC 362.1([47+57]-22)

MATERIAL AND TECHNICAL SUPPORT FOR MOBILE MEDICAL SERVICES IN RURAL AREAS

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 15 Sep 83) pp 55-58

PAKHARIN, V. I., Rostov Oblast Department of Health

[Abstract] Description is provided of the mobile medical services implemented in the Rostov Oblast to serve the rural population. In addition to preventive medicine teams, such mobile services now include disinfection, blood collection from donors, fluorography, and so forth. In 1983 alone, such mobile teams made some 9,300 trips to various rural areas from local hospitals and therapeutic/prophylactic facilities to some half a million rural residents. The duration of such trips is generally 1-2 days in areas with good roads, and 2-3 such trips are made a month. Where roads are lacking, the time required for an average trip is on the order of 5-7 days. Continuous efforts are being made to improve the service vehicles and equip them with the latest in medical diagnostic and therapeutic technology, as well as to motivate and train the appropriate health personnel. The availability of radio-equipped vehicles has been of key importance in the efficient management of the mobile medical teams. References 6 (Russian).
[1544-12172]

CARCINOGEN SUBSTANCES IN FOOD

Tallinn RAHVA HAAL in Estonian 16 Oct 84 p 3

KANN, JURI, candidate of technology, docent, food technology department,
Tallinn Polytechnic Institute

[Abstract] Foodstuffs must contain nutrients required by the body, but not harmful substances, including carcinogens. Up to 70-80 percent of cancers are thought to be caused by external factors. Dr. Higginson, long-time director of the Lyon International Cancer Center thinks that 30 percent of cancers in humans is caused by food. As early as 1979, 18 substances were listed as carcinogenic by the center. There is reason to think that the number is much higher. To date almost 7000 substances have been tested on animals, and T. Maugh claims that 1500 of these are carcinogenic. Such testing of one compound costs up to 500,000 pounds sterling. Human food consists of plant or animal material. Plants can be contaminated by air, surface, water, and also fertilizers and pesticides. Meat and dairy products are mainly contaminated by feeds, and also additives and new reactions. Considerable knowledge has been gained about the carcinogenic nature of polycyclic aromatic hydrocarbons, some heavy metals, nitrosamides, pesticides and toxins. Aromatic hydrocarbons, which are produced at high temperatures, can be found in bread, vegetables, margarine, vegetable oils, roasted coffee nuts and smoked products; very large amounts of these substances have been found in vegetables grown in industrial regions. Thus these substances occur primarily due to external pollution rather than to any intraorganic reactions. Very dangerous heavy metals that can accumulate in the body include lead, cadmium, and mercury. Usually these substances are not prevalent in vegetables, except in industrial regions and along highways where there is lead contamination in leafy vegetables and fruits along a strip 50-100 meters in width. There is major mercury content in some mushrooms that seem to gather mercury from the atmosphere. There is no major heavy metal content in meat and eggs, but there is considerable lead and cadmium in some meat products, such as liver and kidneys. Only an insignificant amount passes from feed through an animal's system into milk. There is a large amount of heavy metals in some fish. Some toxins may be carcinogenic. Their distribution is not affected by varying climate; their production is favored by high humidity, high temperature during the harvest, and by damaged seed. It is interesting that these toxins can also be transferred to animals through feed. In many countries the maximum amounts of permissible toxins have been fixed, fluctuating from 5 to 20 milligrams per kilogram. The temporary allowable limit in the USSR is 5 mg/kg. Another well-researched carcinogen group consists of nitrosamides that are produced in food processing; they appear in the course of secondary or tertiary amide reaction with nitrites. These substances are found in foods treated with nitrites (most meats) or which are smoked. Poor weather and overuse of nitrogen as fertilizer can cause high concentrations of nitrites in vegetables. Health authorities are

taking steps to reduce nitrite content. Temporary limits have been imposed for vegetables to make farmers consider the need to raise healthy foods. The food program will secure adequate nutrient supplies to the population. There will then be a need to establish a quality control system that will minimize the incidence of harmful, including carcinogenic, substances in food.

[1815-9-9240]

FIRST 'ALCOHOLICS ANONYMOUS' PROGRAM IN TAJIK SSR

Moscow TRUD in Russian 7 Sep 84 p 4

KHAMIDOV, R., Dushanbe

[Abstract] M. G. Gulyamov, Doctor of Medical Sciences, chief narcologist of the TaSSR, honored scientist of the TaSSR describes the TaSSR's first "alcoholics anonymous" program in an interview. The program provides for complete anonymity of the patient who visits special offices at narcological dispensaries late at night when the other facilities at the site are closed. A brief history of the disease is recorded under a number assigned to the patient. Treatment begins with conditioned-reflex psychotherapy and includes hypnosis and supportive measures. The personal, social and economic impact of this program is discussed. More than 1000 persons have been treated in this program. More than 57 percent of these have abstained from alcohol for more than 2 years, 80 percent have abstained for 1-2 years and 120-130 patients resumed drinking within 1 year.

[029-2791]

REDUCTION OF ERRORS IN MEDICAL DIAGNOSES

Riga NAUKA I TEKHNIKA in Russian No 9, Sep 84

SHNEPS, MANFRED, Doctor of technical sciences, professor

[Abstract] Extensive use of electronic computers is recommended as a means of reducing errors of diagnosis. The superiority of computer-assisted diagnoses over conventional medical diagnosis is supported by a study conducted at the Moscow Scientific Research Oncological Institute imeni P. A. Gertzen. A machine algorithm for differential diagnosis of peripheral lung cancer, using 82 signs and 76 symptoms (a 32 percent reduction over indicators used in conventional diagnosis), showed the high efficiency of this method in 361 cases, in comparison with diagnosis by a radiologist. Studies by an English surgeon showed that computer-assisted diagnosis of stomach disorders can reduce errors in diagnosis by 50 percent. A proposal for introduction of automatic computer-assisted screening and diagnosis complexes, such as those now being used in the LatSSR, are described and discussed. The complexes are

used to screen for ischemic heart diseases, rheumatic diseases and glaucoma. Prospects for developing automated polyclinics are discussed. A summary of the extensiveness of errors in diagnosis and their personal, social and economic costs is presented with mention of specific situations in Moscow and the USA.

[028-2791]

RADIATION BIOLOGY

UDC 616-008.949.5:546.73.02.60]-85.849.2.015.25-092.9

ENHANCED ELIMINATION OF RADIOACTIVE COBALT

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 21 Dec 83) pp 35-38

RAZUMOVSKIY, N. O. and YELATONTSEVA, N. B.

[Abstract] Ten chelating agents were tested for their effectiveness in enhancing elimination of Co-60 from outbred albino rats, following intraperitoneal administration of the radionuclide (0.7×10^4 Bq/g) and concomitant injection of the agents. Analysis of the tissue levels of Co-60 in the skeleton, liver, spleen, lungs, kidneys and muscles over an 8-day period showed that diethylenetriaminepentaacetic acid (DTPA) and 2,21-diamino-diethyl N, N, N'-tetraacetate DDET) were the most effective agents. Both preparations reduced Co-60 levels in the tissues by 90% or greater in comparison with control levels. Phosphonic analogs were far less effective, while dithiol compounds actually favored elevation of Co-60 levels in some tissues, indicating their low stability in combination with Co-60.

References 2: 1 Russian, 1 Western.

[1551-12172]

UDC 613.165.6.07

HYGIENIC ASSESSMENT OF INDUSTRIAL OPTICAL SOURCES OF RADIATION

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 30 Jan 84) pp 9-12

GVOZDENKO, L. A., Scientific Research Institute of Labor Hygiene and Occupational Diseases, Kiev

[Abstract] An assessment was conducted on the various optical sources of radiation used commercially in various settings, in order to have a baseline of comparison in dealing with potential occupational pathology. The criterion followed in establishing a classification scheme for such radiation was based on the principles outlined by the International Commission on Illumination (1963), which related a given emission spectrum to biological effects. On this basis the various lamps used in industrial

and medical situations, and other emitters or emitting processes, can be categorized into four groups. Group I consists of sources emitting largely infrared radiation, Group II encompasses emitters of infrared radiation in combination with visible and/or ultraviolet light, Group III emitters produce essential ultraviolet and visible light, while Group IV sources include the spectral emitters (heating lamps, lasers, etc.). Such a classification should direct occupational health physicians to potential problems in assessing health risks and causes of pathology in different environments. References 3 (Russian). [1551-12172]

UDC 613.73-07:617.741-004.1:313.13]([47+57]-17)

RADIATION BACKGROUND AND INCIDENCE OF SENILE CATARACT IN FAR NORTH

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 14 Sep 83) pp 30-32

NIZHNIKOV, A. I., MIKETSKIY, G. I., RAMZAYEV, P. V. and TROITSKAYA, M. N., Leningrad Scientific Research Institute of Radiation Hygiene, RSFSR Ministry of Health

[Abstract] The incidence of senile cataract in natives and newcomers to the Murmansk Oblast was determined in reference to cumulative radiation exposure, which differed markedly for the two populations (0.5 rem/year for natives, 0.15 rem/year for newcomers). The sole exception was the pulmonary dose from radon decay, which was equivalent for the two groups. In general, natives of the Far North showed an incidence of senile cataract that exceeded that of newcomers two- to three-fold in the over-65 groups, and there was an age-related increase in the incidence in both cohorts. It was also determined that the mean age of onset in males was 65.8 years, and in females 71.5 years, i.e., a five-year difference. While further studies are being conducted to determine and define all of the environmental and other factors that contribute to the development of senile cataracts under the conditions of the Far North, the fact that the overall incidence in the native population is 1.5-fold higher points to the urgency of the situation in establishing all the risk factors for that group. References 10: 6 Russian, 4 Western. [1551-12172]

PREVENTION BY METHIONINE OF LATE RADIATION SEQUELAE

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 20 Feb 84) pp 83-85

MIRETSKIY, G. I., DANETSKAYA, Ye. V., TROITSKAYA, M. N. and RAMZAYEV, P. V., Leningrad Scientific Research Institute of Radiation Hygiene, RSFSR Ministry of Health

[Abstract] Outbred rats were used to assess the effects of supplemental methionine (140-220 mg/day), fed conjointly with Cs-137 and Sr-90 for a year, on the sequelae of internal irradiation in terms of lifetime and tumor development and onset. Administration of methionine alone was without any adverse effects under the conditions employed. Given with the radionuclides it prolonged the lifetime of the animals from 609 days (radionuclides only) to 671 days (radionuclides + 220 mg/day methionine) or to 647 days (radionuclides + 140 mg/day methionine). In addition, methionine was seen to reduce the incidence of tumors from 43.6% in the radionuclide only group, to 23.3% in the 140 mg/day group, and to 20.0% in the 220 mg/day methionine animals. In conjunction with the decrease in the incidence of tumors, the latent times for tumor onset (lymphosarcomas, adenocarcinomas, fibroadenomas, osteosarcomas) were increased by 34-203 days. Used in the doses recommended for human use by the Pharmacological Committee of the USSR Ministry of Health, methionine has been demonstrated to exert an antineoplastic effect in outbred rats. References 9: 6 Russian, 3 Western. [1551-12172]

ASSESSMENT OF BODY Pu-239 LEVELS

Moscow GIGIYENA I SANITARIYA in Russian No 7, Jul 84 (manuscript received 3 Jan 84) pp 85-86

DEMINA, G. A. and KHALTURIN, G. V.

[Abstract] In view of the commercial and industrial importance of Pu-239 and its inevitable access to animals and humans, Wistar rats were employed in an evaluation of the effects of physicochemical form of Pu-239, and route of administration, on organ and tissue distribution and elimination from the body of this radionuclide. Polymeric Pu(IV) (PP), Pu(VI) nitrate (PN) or Pu(IV) pentacine (PPC) were injected intramuscularly or subcutaneously, or administered into the trachea to give a dose of 111 kBq per animal. Retention at the entry site and elimination were studied on the first and 32nd

postadministration day, along with whole body blood, liver and skeletal measurements of radioactivity. The resultant data showed marked variations in retention, at the site of administration, and elimination in relation to the route of administration. PPC showed the highest rate of elimination and PP the lowest. PPC is largely eliminated via the kidneys (79.5-83.6%), with 75.7-82% excreted in the first day (46.6-65.4% during the first 2 h). In addition, PP and PN were much more rapidly eliminated when administered by the intratracheal route than when injected subcutaneously or intramuscularly, but the entire process of elimination was far less efficient than with PPC. Transition coefficients were calculated and tabulated for extrapolation, of such accumulation data, to man.

References 5 (Russian).

[1551-12172]

ECHOVIRUS INFECTION

Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 84 (manuscript received 26 Dec 83) pp 48-51

IL'INSKIY, Yu. A., MARCHENKO, V. I. and POPOV, V. N., Chair of Infectious Diseases, Stavropol Medical Institute

[Abstract] A brief review is provided of echovirus infections, based on both Soviet and Western literature. Coverage is accorded to the pathology and pathogenetic characteristics of the diseases, common and uncommon clinical findings, and epidemiology with emphasis on the global nature of echoviral infections. The point is made that definitive diagnosis cannot be advanced on the basis of clinical data alone, but requires laboratory tests involving tissue culture and serologic techniques. Control measures encompass both avoidance, and exposure to nonpathogenic enteroviruses that can displace pathogenic echoviruses from the gastrointestinal tract.

References 45: 21 Russian, 24 Western.

[1544-12172]

CONFERENCES

BRIEFS

FIRST-AID EQUIPMENT--The exhibition of surgical equipment at the Moscow City Scientific Research Institute of First Aid imeni N. V. Sklifosovskiy closed. The products of nine firms in the FRG and Switzerland were displayed. Diagnostic and anesthesia apparatus and various instruments were exhibited on stands. The Ozonosan instrument for treatment with ozone developed by medical men in the FRG jointly with surgeons at the Scientific Research Institute of First Aid imeni N. V. Sklifosovskiy was demonstrated for the first time in our country. The following two innovations attract visitors' attention: A Universal place for roentgenography of the patient in various positions. The operating table of the Heidelberger Firm, owing to the eight-section cover structure, enables the patient's body to assume the necessary position. "All this equipment was developed in cooperation with the leading clinics throughout the world," V. Pezelt, director of the West German MED-AG Firm, says. "It was very pleasant for us to work with Soviet specialists." /By Ye. Kuz'mina/ /Text/ /Moscow MEDITSINSKAYA GAZETA in Russian 31 Oct 84 p 4/ 11,439

FIRST SOVIET-INDIAN SYMPOSIUM--The first Soviet-Indian symposium was held at the All-Union Scientific Center of Surgery of the USSR Academy of Medical Sciences. N. N. Malinovskiy, academician of the USSR Academy of Medical Sciences, made a speech of welcome to the guests. Soviet and Indian scientists shared their research experience in the area of cardiovascular surgery, microsurgery and neurosurgery. "Academician B. V. Petrovskiy performed the first heart operation in our country," Prof G. B. Parulkar, head of the Department of Cardiovascular and Thoracic Surgery of the Medical Center in Bombay, said. "Today we are glad at the strengthening of professional contacts with the personnel of the center headed by B. V. Petrovskiy." /By I. Volodina/ /Text/ /Moscow MEDITSINSKAYA GAZETA in Russian 31 Oct 84 p 4/ 11,439

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MISCELLANEOUS

BRIEFS

NIGERIAN PUBLIC HEALTH DELEGATION--At the invitation of the Central Committee of the Trade Union of Medical Workers a delegation of the trade union of Nigeria's public health workers visited the USSR. During the 10-day visit A. Maygatari and E. Olagbaye, representatives of the national executive committee of the trade union, and D. Odzho, member of the trade union committee of the university clinic in the city of Zaria, visited medical institutions in Moscow, Baku and Voronezh. "I have never been in the Soviet Union," A. Maygatari said. "I have seen snow for the first time. I have met Soviet people, who received us very warmly and kindly. I admire the system of public health and free medical care in your country. I especially remember the Voronezh Oblast Clinical Hospital. This is a whole medical city provided with the latest equipment. We have also visited polyclinics, kindergartens and preventive sanatoriums and everywhere we have become acquainted with the work of trade union committees. The talks in the Central Committee of the trade union of medical workers are of great importance for our delegation. After all, in Nigeria trade union organizations are very young. As yet we do not have experience. The trade union of public health workers in the State of Kano, which I head, now has 10,000 people. As yet not all medical workers have joined the organization. A great deal has to be done. Familiarization with the practical experience of the trade union of Soviet medical workers will help us." /By Ye. Kokurina/ /Text/ /Moscow MEDITSINSKAYA GAZETA in Russian 31 Oct 84 p 4/ 11,439

USSR-MOZAMBIQUE COOPERATION--A protocol of cooperation in the area of public health for 1985-1986 between the ministries of health of the USSR and the People's Republic of Mozambique was signed. Signing this important document, S. P. Burenkov, USSR minister of health, said the following: "Our cooperation is developing dynamically and efficiently. We will continue to give help to the People's Republic of Mozambique in the training of national medical personnel and in the fight against malaria, to provide deliveries of Soviet medical equipment and instruments and to send specialists on missions." Pascoal Mocumbi, minister of health of the People's Republic of Mozambique, made a speech in reply. /By I. Luk'yanova/ /Text/ /Moscow MEDITSINSKAYA GAZETA in Russian 31 Oct 84 p 4/ 11,439

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